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ARAB USERS’ ACCEPTANCE AND USE OF MOBILE PHONES: A CASE OF YOUNG USERS IN IRAQ, JORDAN AND UAE

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A Thesis in fulfilment of the requirements of Anglia Ruskin University for the degree of Doctor of Philosophy

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ABSTRACT

LORD ASHCROFT INTERNATIONAL BUSINESS SCHOOL (LAIBS)

DOCTOR OF PHILOSOPHY

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The use of mobile phones has great potential in the Arab region. Nevertheless, recent reports on the performance of mobile companies in this region revealed a decrease in revenues since 2013. The main aim of this research was to propose a conceptual model explaining the factors that can predict Behavioural Intention and Actual Use of mobile phones (smartphones) by young Arab customers in Arab countries, namely Iraq, Jordan and the United Arab Emirates (UAE). In addition, an analysis of the issues surrounding mobile phone adoption and use in these countries is provided.

The analysis of the literature showed that the extended Unified Theory of Acceptance and Use of Technology (UTAUT2) can provide a good overview of the factors that can affect mobile phone adoption and use. The analysis showed that there is a gap in the literature in terms of testing this theory in cross-national research in an Arabian context. Accordingly, the research proposed a new conceptual model based on an extension of this theory. The methodology was based on positivism and the ontological stance was objectivism based on the deductive approach to test the conceptual framework. A total of 1599 questionnaires were distributed in the three countries to users aged 18-29 years old using multistage cluster sampling. Data were analysed using Partial Least Squares.

The findings indicated that the proposed extended model fits well in the three countries. The factors Perceived Relative Advantage, Effort Expectancy, National IT Development, Habit, Price Value, Culture-Specific Beliefs and Values and Behavioural Intention were significant in all three countries. Technological Culturation was significant in Iraq only. Enjoyment was significant in Jordan and UAE only. Several challenges facing the efficient use of mobile phones were also identified.

This research contributes to the existing literature by proposing a conceptual model for mobile phone adoption and use by extending the UTAUT2 in an Arabian context. It also provides information to policymakers and mobile companies in Iraq, Jordan and UAE to help them understand the needs of their customers.

Keywords: Mobile phone adoption, young Arab customers, Arab culture, technological infrastructure, UTAUT2

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List of Acronyms

A-TAM- Augmented Technology Acceptance Model

AVE- Average Variance Extracted

BI- Behavioural Intention

CB-SEM- Covariance-Based Structural Equation Modelling

CFA- Confirmatory Factor Analysis

CMB- Common Method Bias

CMC- Commission of Media and Communications

CMV- Common Method Variance

CSBV- Culture-Specific Beliefs and Values

CSV- Comma Separated Value

DoI- Diffusion of Innovation

DTPB- Decomposed Theory of Planned Behaviour

EE- Effort Expectancy

Enj- Enjoyment

FC- Facilitating Conditions

GCC- Gulf Cooperation Council

GDP- Gross Domestic Product

GDP-PPP- Gross Domestic Product-Purchasing Power Parity

GSMA- Group Special Mobile Association

HAP- Habit/Automaticity Perspective

HM- Hedonic Motivation

HT- Habit

IAP- Instant Activation Perspective

ICT- Information Communication Technology

IS- Information Systems

IT- Information Technology

ITU- International Telecommunication Union

ITT/ Information Technology Transfer

LAIBS- Lord Ashcroft International Business School

M-commerce- Mobile Commerce

MENA- Middle East and North Africa

MGA- Multi Group Analysis

M-health- Mobile Health

MM- Motivational Model

MMS- Multimedia Messaging Service

MOBAPPS-Mobile Applications

MOBBANK-Mobile Banking

MOBEMAIL-Mobile Email

MOBINT-Mobile Internet

MOBSM-Mobile Social Media

MoICT- Ministry of Information Communication Technologies

MOPTAM- Mobile Phone Technology Adoption Model

MPAUM- Mobile Phone Acceptance and Usage Model

MPCU- Model of PC Utilisation

MVNO- Mobile Virtual Network Operators

ND- National IT Development

PBC- Perceived Behavioural Control

PC- Personal Computer

PE- Performance Expectancy

PEOU- Perceived Ease of Use

PLS- Partial Least Square

PRA- Perceived Relative Advantage

PPP- Purchasing Power Parity

PPS- Probability Proportional to Size

PU- Perceived Usefulness

PV- Price Value

RA- Relative Advantage

R&D- Research and Development

SCT- Social Cognitive Theory

SE- Self-Efficacy

SEM- Structural Equation Modelling

SI- Social Influence

SLT- Social Learning Theory

SMS- Short Messaging Service

SN- Subjective Norm

SPSS- Statistical Package for the Social Sciences

TA- Technology Acceptance

TAM- Technology Acceptance Model

TC- Technological Culturation

TRA- Theory of Reasoned Action

TRA- Telecommunication Regulatory Authority

TRC- Telecommunication Regulatory Commission

TPB- Theory of Planned Behaviour

UAE- United Arab Emirates

UK- United Kingdom

UNDP- United Nations Development Programme

USA- United States of America

USE- Actual Use

USF- Universal Service Fund

UTAUT- Unified Theory of Acceptance and Use of Technology

VIF- Variance Inflation Factor

VOIP- Voice Over Internet Protocol

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Reflection Section

This section is dedicated to providing a background about the researcher and reflecting on the work that was carried out as part of or related to this research. As a graduate with a degree in computing science and business informatics and a researcher with an Arab background, the topic of technology adoption in Arab countries in relation to business was particularly interesting. These reasons were the main motivators for conducting research in the area of technology adoption in Arab countries. The PhD journey was certainly a transforming experience. Throughout this journey, the researcher attended several conferences, at some of which research papers were presented and published. These conferences were:

- IFIP Conference on e-Business, e-services and e-Society, 2016, Swansea
- International Telecommunication Society Europe conference, 2016, Cambridge
- UK Academy of Information Systems (UKAIS) conference, 2016, Oxford
- Institute for Small Business and Entrepreneurship (ISBE) conference, 2016, Paris
- Institute for Small Business and Entrepreneurship (ISBE) conference, 2015, Glasgow
- UK Academy of Information Systems (UKAIS) conference, 2015, Oxford
- International Conference of Information Systems, 2015, Dubai
- Institute for Small Business and Entrepreneurship (ISBE) conference, 2014, Manchester

Attending the above conferences enabled the researcher to be updated with the most trending topics in Information Systems adoption and to become aware of the uniqueness of this research and its importance in terms of its contribution to this field.

The researcher attended the 15th IFIP 2016 conference, at which there was a chance to meet the main researcher who developed the Unified Theory of Acceptance and Use of Technology, professor Viswanath Venkatesh, in person. The researcher also presented this research at many events related to PhD research, including the SCRUM event at Anglia Ruskin University Cambridge in 2014. The researcher also presented the research and obtained feedback and recommendations from experts in the area of Information Systems adoption at the 2016 UKAIS PhD Consortium in Oxford. Furthermore, the researcher presented the research at the 10th Annual Research Student Conference organised by Anglia Ruskin University in 2016 in Chelmsford. The researcher took the opinions and recommendations provided by academics and experts in different fields and areas including Information Systems, technology adoption, human-computer interaction, statistics and quantitative analysis and experts in Partial Least Squares and SmartPLS V3 and SPSS software into consideration during the development of this research. These recommendations were extremely helpful.

As a female researcher, collecting data (face-to-face) from three Arab countries with such a high number of questionnaires was a major challenge in this research. However, being a researcher who comes from an Arab background and speaks English and Arabic fluently helped the researcher to travel to each of Iraq, Jordan and UAE and collect the data successfully from each of them.

The skills gained by the researcher from conducting this research throughout the PhD journey helped to be able to write and publish research papers which were related to this research and published in conferences and journals as listed in Appendix U.

Chapter One: Introduction

1.1 Introduction to Research Area

Technology has increasingly played a critical role in many aspects of life. The benefits that come as an outcome of technology usage at an individual and a country level are widely acknowledged in the existing literature (Melenhorst et al., 2001; Atkinson and Mckay, 2007). According to Rogers (2003, p.21), technology adoption is “a decision to make full use of an innovation as the best course of action available”. Mobile phones are an important tool in reducing the digital divide between developed and developing countries (Kamel and Farid, 2007). Mobile technology is able to change people’s lifestyle (Sabry et al., 2011). There is a growing awareness of the requirement to address the issue of technology adoption in some parts of the world that are on the periphery as a result of economic restrictions or other barriers (Foster and Rosenzweig, 2010). Since the first smartphone emerged in 2007, mobile devices have incorporated a substantial number of services beyond the calling functionality, all integrated within the device (Phan and Daim, 2011; Shah, 2014). Shiraishi et al. (2011, p.3) defined smartphones as “A mobile phone or PHS that incorporates a public general-purpose operating system, to which users can freely add applications, extend functionality, or customize”. These mobile services (additional applications) have been found significant for the usage of mobile phones (Sabry et al., 2011).

Previous studies showed that the Technology Acceptance Model (TAM) developed by Davis (1989) was the most robust technology acceptance model. Later on, Venkatesh et al. (2003) developed a unified model (the Unified Theory of Acceptance and Use of Technology (UTAUT)) based on the previous most well-known technology adoption models to study employees’ adoption of technology in organisations.

Venkatesh et al. (2012) developed this model further to create the extended Unified Theory of Acceptance and Use of Technology (UTAUT2) to study customers' adoption and use of technology (mobile Internet).

1.2 Rationale for the Research

There is a great potential for mobile phone (smartphone) adoption in the Arab region. Nevertheless, since 2013 mobile companies in Arab countries have experienced a drop in revenues (GSMA, 2015b), leading to increased competition between them. These companies are striving to build a strong customer base and increase their profit, which makes identifying the factors that can affect actual customers' adoption of the new generation of mobile phones, smartphones, important and required. Based on their literature review, Baabdullah et al. (2013) identified a need to provide an in-depth analysis of the factors that can affect the adoption of mobile technologies in the Middle East.

Halaweh (2015) found that the majority of previous studies conducted on technology adoption in Arab countries used or extended TAM and examined the use of a single technology. However, TAM on its own is insufficient to fully explain technology adoption, as its constructs are too general (Fang et al., 2005; Rouibah and Hamdy, 2009). Baabdullah et al. (2013) explained that there is a lack of research that extends or even tests the UTAUT2 (Venkatesh et al., 2012) in Arab countries, despite the importance of this theory, which is widely acknowledged in the literature. This could be because the theory is new, as it was developed in 2012 by extending the original UTAUT developed by Venkatesh et al. (2003). In addition, previous studies identified the need for conducting cross-cultural research within the Middle East from different countries, groups or individuals (Al-Sukkar, 2005; Al-maghrabi and Dennis, 2009;

Halaweh, 2015). Studying technology adoption in the Arab region is important due to its large population, of which young people form the highest segment (GSMA, 2013). This makes the Arab region a significant market with great potential. Baabdullah et al. (2013) explained that there is a need for a generalised model that can be used within the context of the Middle East. In fact, the inclusion of a single culture, a single country, a single type of participant and a single task to study technology adoption using the original UTAUT (Venkatesh et al., 2003) were major limitations in the existing literature (Baabdullah et al., 2013; Williams et al., 2015). The inclusion of a single task to be studied, for example studying the adoption of a single mobile application, may not offer opportunities for generalisation.

In their recent study, Venkatesh et al. (2016) reviewed the literature on the UTAUT (Venkatesh et al., 2003) and UTAUT2 (Venkatesh et al., 2012). Venkatesh et al. (2016) evaluated how the theory was extended in previous studies conducted between September 2003 and December 2014. The authors identified that most previous studies focused on specifying changes to the theory rather than extending it. The authors also identified that whilst previous research studied the moderating effects of national culture in the UTAUT, other location attributes were not examined when extending the theory. The authors provided several recommendations for future research to provide significant theoretical contributions to the field of technology adoption and use. They recommended investigating location attributes as higher level contextual factors to extend the UTAUT. Examples of location attributes, including national culture, regional economic status and industry competition, were proposed. They explained that this could be carried out using multi-samples and multi-study research to theorise the influence of location in the model. The research presented here fills this gap by examining samples from different countries (with different economic, social, cultural and technological development levels) in one region and extends the theory by including a factor related to national IT development (in which industry conditions were also taken into consideration) and two factors related to culture. In addition, Venaktesh et al. (2016) explained that there is a lack of studies examining the effects of moderators in the model. The framework proposed in this research included moderating factors such as age, gender, education, income and experience.

This research addresses the gaps identified by Al-Sukkar (2005), Al-maghrabi and Dennis (2009), Baabdullah et al. (2013), Williams et al. (2015), Halaweh, (2015) and Venkatesh et al. (2016) by testing and integrating new constructs in the UTAUT2 (Venkatesh et al., 2012), then applying the extended model in three different Arab countries (Iraq, Jordan and the United Arab Emirates (UAE)) within the context of mobile phone (smartphone) adoption and use. The focus of this research is mainly theoretical. It proposes a conceptual model for mobile phone adoption and use by testing the UTAUT2 and extending it within Arab countries. During their development of the UTAUT2, Venkatesh et al. (2012) recommended testing the theory in different countries and also different age groups. Extending the model by including relevant factors increases the applicability of the model. This research examined the UTAUT2 boundaries within different Arab countries to better understand the applicability of the model across different Arab countries.

1.3 Research Boundaries

This section provides the boundaries of the research in terms of the technology used to test the proposed model, the participants and the locations in which the study took place, along with the reasons behind selecting each of these boundaries.

1) ***Technology***: This research studies the adoption and use of mobile phones, more specifically, the adoption of the new generation of mobile phones, smartphones. It can be contended that the adoption of mobile phones cannot be studied without the inclusion of mobile applications. This research studied the adoption and use of the handset as well as its mobile applications which apply to smartphones in order to fully understand this phenomenon. Due to the specific nature of the different mobile applications being developed and used for many different purposes, and due to differences in users' adoption and usage patterns of these applications, this research only studies mobile application adoption in general to complement smartphone adoption. This research does not provide an investigation of the factors that can affect each individual type of mobile application separately, for example mobile learning, m-commerce, mobile government or mobile banking, as each of these applications may require additional factors that are specific to its adoption. This is beyond the scope of this research and has been investigated before in Arab countries (for example the studies conducted by Alkhunaizan and Love (2012), Nassuora (2012), Al Mashaqba and Nassar (2012), Al Otaibi (2013), Baabdullah et al. (2015)).
2) ***Participants***: The participants of this research are actual users, customers, not students or employees. The inclusion of a sample of students may not be sufficiently representative of the real world (Dwivedi et al., 2008). The use of students was found to be a limitation of many studies that tested the UTAUT, as found in the meta-analysis conducted by Williams et al. (2015). It must be acknowledged that mobile adoption and usage by actual customers in a voluntary setting is different from a workplace or an educational institution. This research tests Actual Usage as well as Behavioural Intention. Analysing actual usage is

important to analyse the current market position and customer performance. In order to obtain an accurate view of actual customer adoption, the study had to use a sample of actual customers. Many of the studies included in the literature review (Chapters Two and Three) were based on student or worker adoption and usage, and are included to inform the research and help the researcher to build a more in-depth view. Furthermore, the research uses young Arab customers aged 18-29 years only. Young people under the age of 30 years form more than 60% of the Arab population (GSMA, 2013). Young people form a high segment of the population in the Arab countries in general and also in the three countries studied.

3) ***Locations***: This research studies mobile phone adoption within the context of Arab countries, more specifically, Iraq, Jordan and UAE. There are a number of reasons for selecting these three countries. First, Iraq forms the third largest mobile market in the Arab region (GSMA, 2014). However, the country is considered technologically behind, and there is a lack of research on technology adoption in general and mobile phone adoption in particular in Iraq. Furthermore, mobile companies in Iraq have experienced the highest drop in revenues in the Arab region (GSMA, 2015b). Second, Jordan, which is in the middle in terms of the level of technology adoption compared to Iraq and UAE. The level of technology adoption in Jordan is higher than the level of technology adoption in Iraq and lower than that in UAE. Although the country suffers from a high unemployment level among young people, mobile phone adoption is considered high in comparison to other Levant countries. Mobile operators in Jordan have also experienced a drop in revenues in the last few years (GSMA, 2015a). The technological infrastructure in Jordan is between Iraq and UAE. Third, UAE, which is the most advanced Arab country in terms of mobile phone adoption and penetration. The country has one of

the highest mobile adoption levels and smartphone penetrations in the world. The inclusion of these three countries enabled the researcher to compare how the model fits in different countries with different characteristics but within the same region to clearly understand how the proposed model fits within the least developed and the most developed Arab countries. Other Arab countries were not included. A high number of studies have tested the UTAUT in Qatar and Saudi Arabia, which made conducting another study in these countries not as important as for the three countries included in this research. This research takes place in urban areas (major cities) in these three countries. Urban areas form a large part of the three countries in the study. Generally, urban areas also have higher adoption rates than rural areas, making investigating mobile phone adoption and usage more feasible.

1.4 Aim and Objectives

The main aim of this research is to enhance knowledge on the topic of technology acceptance by proposing and examining a conceptual model explaining the factors that can predict Behavioural Intention and Actual Use of mobile phones, more specifically the new generation of mobile phones, by young Arab customers in the specified Arab countries. In addition, an analysis of the issues surrounding mobile phone adoption and use in these countries is provided. Accordingly, the following research objectives were formulated;

1. To examine the viability of the UTAUT2 model and extend it within the context of mobile phone adoption and use in Arab countries, namely Iraq, Jordan and UAE.
2. To analyse the factors that affect young Arabs' mobile phone adoption and use in Arab countries, namely Iraq, Jordan and UAE.

3. To examine young Arab customers' perceptions of the obstacles facing mobile phone adoption and use in Iraq, Jordan and UAE.
4. To provide insights into future trends in mobile phone adoption and use for companies currently investing or willing to invest in technology in these countries.

1.5 Significance and Originality

The significance of this research is twofold. First, in terms of theory extension and contribution to IS adoption theories and literature, which is the theoretical contribution. Second, in terms of practice by discussing important issues related to the adoption and use of the latest generation of mobile phones. From a theoretical (conceptual) perspective, there are three gaps this research aims to tackle.

First, there is gap in the existing technology acceptance theories in terms of integrating factors related to culture (more specifically, the cultural attributes related to the location of the research and the specific technology under investigation) and national IT development. This gap also exists in the UTAUT and UTAUT2 and the studies that examined or extended these theories as indicated in Venkatesh et al.'s (2016) study. The majority of the existing technology acceptance theories, including the Theory of Reasoned Action (TRA) (Fishbein and Ajzen, 1975; Ajzen and Fishbein, 1980); Technology Acceptance Model (TAM) (Davis, 1989); Social Cognitive Theory (SCT) (Bandura, 1986; Compeau and Higgins, 1995a); Theory of Planned Behaviour (TPB) (Ajzen, 1991); Model of PC Utilisation (MPCU) (Thompson et al., 1991; Thompson et al., 1994); Decomposed-Theory of Planned Behaviour (D-TPB) (Taylor and Todd, 1995b); the extended Technology Acceptance Model (TAM2) (Venkatesh and Davis, 2000); Diffusion of Innovation theory (DoI) (Rogers, 2003); Unified Theory of

Acceptance and Use of Technology (UTAUT) (Venkatesh et al., 2003) and the extended Unified Theory of Acceptance and Use of Technology (UTAUT2) (Venkatesh et al., 2012) assumed a high level of ICT infrastructure. The reason behind this could be that they were created and tested in the developed world where the level of ICT infrastructure is high and technology products are widely available. This does not apply to developing countries, more specifically Arab countries. Furthermore, although these theories acknowledge the importance of social factors in ICT acceptance, factors related to culture and its effect on technology acceptance and use are not well considered in them.

Second, there is a gap in the technology acceptance literature in terms of extending and testing the UTAUT2 (Venkatesh et al., 2012) using multi-samples from different countries within the Arab region. The use of multi-samples when extending and testing the UTAUT (Venkatesh et al., 2003) and UTAUT2 (Venkatesh et al., 2012) was recommended in the recent study conducted by Venkatesh et al. (2016).

Third, there is a gap in the existing literature in terms of investigating the adoption of the latest generation of mobile phones, smartphones, in the Arab countries. Previous studies tested the UTAUT (Venkatesh et al., 2003) and UTAUT2 (Venkatesh et al., 2012) within the context of individual mobile applications in Arab countries, for example; mobile banking in Jordan (Abu-Shanab and Pearson, 2007; Abu-Shanab and Pearson, 2009; Abu-Shanab et al., 2010; Al Mashaqba and Nassar, 2012; Al-Qeisi et al., 2014), different systems in Saudi Arabia including mobile commerce (Alkhunaizan and Love 2012), mobile learning (Nassuora, 2012), mobile exchange (Al Otaibi, 2013), mobile government (Baabdullah et al., 2015), mobile learning (Badwelan et al., 2016), different systems in Iraq including mobile learning in higher education (Jawad and Hassan, 2015). However, there is a lack of research that studies the adoption of smartphones (including the adoption of the handset as well as mobile applications which apply to smartphones in order to fully understand this phenomenon) in a cross national research within the Arab region.

This research contributes to the existing literature by filling the three gaps stated above. The importance of this study lies in the fact that it contributes to the academic and theoretical debates as it extends the UTAUT2 (Venkatesh et al., 2012) within the context of smartphone adoption and use by adding factors related to culture (more specifically the cultural attributed related to Arab's mobile phone adoption and use) and national IT development as well as two new moderating factors including income and education, and testing the proposed conceptual framework in three different Arab countries namely, Iraq, Jordan and UAE.

Although the topic of technology adoption has been widely discussed in the existing literature (Davis, 1989; Ajzen, 1991; Taylor and Todd, 1995b; 1995c; Venkatesh et al., 2003; Legris et al., 2003; Venkatesh et al., 2012), relatively few attempts have been made to understand technology adoption at the individual customer level in Arab countries. The lack of research on technology adoption within the context of Arab countries compared to the rest of the world has been indicated in previous studies (Rose and Straub, 1998; Rouibah and Hamdy, 2009; Baabdullah et al., 2013). Virta et al. (2011) and Puumalainen et al. (2011) highlighted the importance of finding the issues associated with successful mobile penetration in developing countries due to the limited amount of research in this area on these countries. Rouibah et al. (2011) recommended the investigation and application of different technology adoption models within the context of Arab countries. This cross-cultural/national research contributes to the existing technology adoption theories by proposing a model that includes the factors that can predict Behavioural Intention and Actual Use of the new generation of mobile phones in the specified countries. Therefore, this study extends and tests the UTAUT2, developed by Venkatesh et al. (2012) in this context.

From a practical point of view, the results and recommendations provided are significant for technology companies in order to increase their chances of being successful and increase revenues in such a challenging market as these issues need to be addressed by firms for success. Mobile services (SMS and MMS) have proved to be significant in enabling brands to implement new additional successful marketing techniques to directly reach and increase the satisfaction of a large segment of their customers (Nysveen et al., 2005b). The benefits of using mobile phones in the region extend to businesses and governments and the contribution to GDP (4.4% in 2013) as well, and it is expected to contribute further in upcoming years (GSMA, 2014). One million people are provided with jobs by the mobile industry in the region (GSMA, 2014). The mobile connections penetration rate is expected to reach 126% by 2020 (GSMA, 2014) and smartphones are expected to reach 65% by 2020 (GSMA, 2015b). With less space for growth, due to the high number of mobile subscribers in the Arab region, and the drop in revenues that mobile companies in this region have experienced in the past few years, mobile companies are striving towards providing more innovative solutions and new applications and finding new ways to increase customer satisfaction. To young Arab customers, smartphones are still new and less used than old mobile phones. The number of smartphone users is certainly less than the number of mobile phone users in Arab countries, as these countries are still in the transition period from the old mobile to the new smartphone era. Smartphone usage extends the use of standard mobile phones, with the inclusion of various types of mobile applications, for instance, gaming, m-commerce, m-mobile and mobile social media.

The benefits of smartphones to both individuals and telecom companies are significant. The use of smartphones has extended into different fields such as education, health and government services, providing benefits to its users as well as increasing the efficiency of the various services provided in these sectors. In fact, the benefits of smartphones have extended to the country level, as they provide a good source of income. Abbasi (2011, p.25) stated that "According to the analysis of 120 countries, for every 10 percentage point increase in the penetration of mobile phones, there is an increase in economic growth of 0.81 percentage points in developing countries, versus 0.60 percentage points in developed countries". Four per cent of the GDP in the Arab countries was generated by mobile technology and services in 2014 (GSMA, 2015b). The proper adoption and usage of the new generation of mobile phones by actual customers will not only provide various benefits to these customers but also to telecommunication companies and various sectors in these countries. Therefore, the results of this research benefit young individual Arab users, policymakers in the countries included in the study, mobile application developers and mobile companies and telecommunication companies operating in the three countries.

With reference to Avison and Pries-Heje's (2005) points on how a PhD thesis can be original, the empirical work in this study (face-to-face distribution of the questionnaires to 18-29 years old in three Arab countries) is original. Also, this study extended an existing model (UTAUT2) and tested the new model (built based on previous theories) in three different Arab countries, namely Iraq, Jordan and UAE, which contributes to the originality of this research.

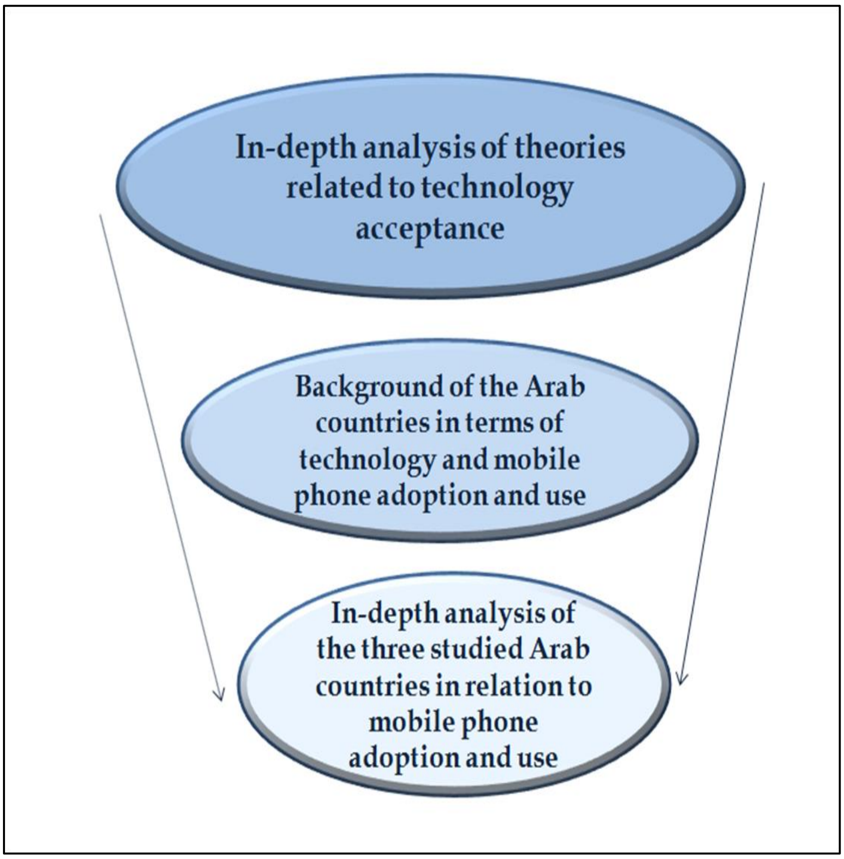
1.6 Thesis Structure

This thesis comprises eight chapters. Chapter One includes the introduction and rationale for the research, the research boundaries, its aims and objectives and its significance and originality.

Chapter Two includes an in-depth analysis of existing technology acceptance theories, their strengths and weaknesses and the similarities and differences between them.

Chapter Three includes two parts. The first part involves analysing mobile phone adoption and use within the context of Arab countries. The second part includes a more in-depth look at the three countries included in the study, Iraq, Jordan and UAE. Figure 1-1 below provides an illustration of how the literature was analysed and the process of selection.

Figure 1-1: Conduct of the Literature Review (Chapters Two and Three)



Source: Author’s own

Chapter Four builds on the previous two chapters by presenting the conceptual framework proposed in this research.

Chapter Five starts by explaining the philosophical underpinning underlying this research, followed by the research paradigm, research design and research methods.

Chapter Six includes an implementation of what was described in Chapter Five and the analysis of the data from each country followed by a cross-country analysis of the data.

Chapter Seven offers the discussion and conclusions. It presents a discussion of the results obtained in Chapter Six and a discussion with regard to the achievement of each of the objectives outlined in Chapter One.

Chapter Eight includes the research’s contribution to knowledge, the research limitations and directions for future studies.

1.7 Chapter Summary

This chapter laid the foundation for this research by presenting the research background, rationale, aim, objectives and significance. This chapter also provided the context and boundaries of this research. Furthermore, the structure of the thesis was explained by outlining the content of each chapter. To obtain a background on the area covered in this research, a literature review within the area of technology acceptance should be provided. As outlined in the previous section, the next chapter (Chapter two) provides a review and analysis of the mostly used technology acceptance theories in the existing literature, which will help to select the appropriate model to form the basis of the conceptual framework proposed in this research.

Chapter Two : Theories of Technology Acceptance

2.1 Introduction

This chapter analyses the different technology acceptance theories in chronological order, based on how they have developed in academic debates. A review of the main concepts, theories and models in relation to technology acceptance and use in the literature is provided in order to develop a conceptual framework based on the findings of the existing body of literature.

2.2 Theories Related to Technology Acceptance

The following sections outline the main technology acceptance theories in the literature. In each section, the constructs of each theory, how the theory was developed and applied and its strengths and limitations are explained. Each section is linked to the subsequent sections, as these theories are interrelated.

2.2.1 Theory of Reasoned Action (TRA)

The Theory of Reasoned Action (TRA) was primarily developed to understand and predict human social behaviour (decision-making). TRA formed an important starting point for many of the technology acceptance theories and models which extended it, as it provided insights on behaviour. The theory was originally introduced and developed by Fishbein and Ajzen (1975) and Ajzen and Fishbein (1980). One of the main constructs of the theory was personal attitude towards Behavioural Intention (BI). This was defined in Ajzen and Fishbein (1980, p.8) as “The person’s belief that the behaviour leads to certain outcomes and his/her evaluations of these outcomes”. Attitude refers to the person’s evaluated beliefs about the consequences of performing a behaviour (Ajzen and Fishbein, 1980). Subjective Norm (SN) was defined as “The person’s beliefs that specific individuals or groups think he/she should or should not perform the behaviour and his/her motivation to comply with the specific referents” (Ajzen and Fishbein, 1980, p.8). The strengths of Subjective Norms depend on the individual’s normative beliefs as well as the individual’s own willingness to comply with the opinion of other individuals around them. Ajzen and Fishbein (1980) stated that both constructs constitute the intention to perform a behaviour. BI is an immediate predictor of behaviour in TRA. It refers to the process of the individual’s readiness (cognitively) to perform a certain behaviour. Accordingly, the possibility of a person performing a certain behaviour depends on their intentions.

The attitude towards behaviour is demonstrated through the individual’s evaluation of the belief and the outcomes. Within the context of this research, the individual Arab’s attitude towards the use of a mobile phone can, for example, be that it is useful for connecting to others or helps to perform certain tasks quickly, or they may believe that it is expensive. In TRA, both Attitude towards the act of behaviour and SN were found to affect BI, which in turn, affects behaviour. BI is an indication that the person is ready to conduct a behaviour. In fact, Intention was also found to be a major determinant of behaviour in subsequent theories related to technology acceptance which stemmed from TRA. TRA stated that intention and beliefs have a critical effect on actual use.

The theory proved to be effective (Godin, 1994). It is based on the assumptions that individuals’ behaviour is usually planned and rational and that there are no other factors that can affect it, for example, habit or other external factors surrounding the individual that can facilitate or hinder the performance of the behaviour. The theory measures behaviour under volitional control, which is not always the case. Thus, the theory is unable to predict the expected significant relationship between Behavioural Intention and behaviour where there is no or little volitional control.

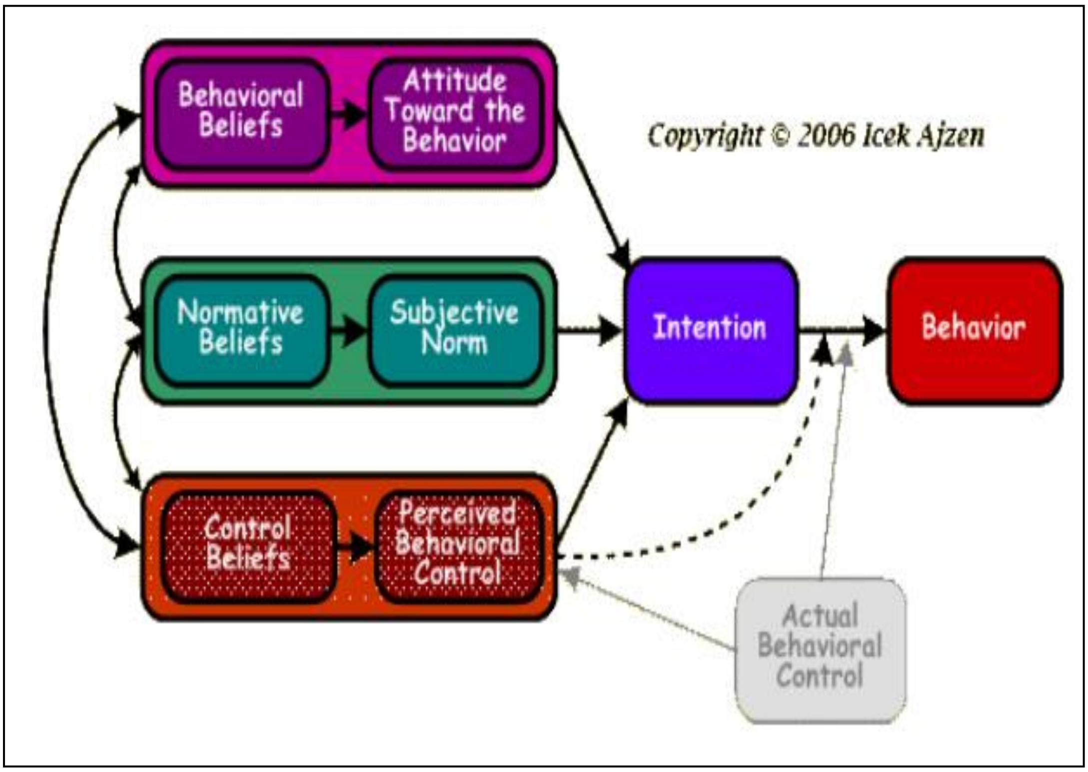
Although TRA has formed the basis of many of the subsequent models related to technology adoption, the theory has its own limitations (Sarosa, 2009). TRA does not account for factors surrounding the individual. Therefore, the theory does not take into consideration the environment surrounding the individual which they may not be able to control, but can affect their behaviour (Sarosa, 2009). The next section provides an analysis of the Theory of Planned Behaviour (TPB), which was developed to overcome this limitation.

2.2.2 Theory of Planned Behaviour (TPB)

The Theory of Planned Behaviour (TPB) was developed by Ajzen (1985; 1991) in order to overcome the limitations of TRA. The theory was an extension of TRA. It extended TRA by including an additional variable, Perceived Behaviour Control (PBC). The Theory of Planned Behaviour (TPB) is one of the most fundamental theories related to human behaviour (Morris et al., 2012). The theory was developed by Ajzen (1985; 1991), it evolved from the Theory of Reasoned Action (TRA). Morris et al. (2012, p.5) stated, “The theory is able to predict 20-30% of the variance in behaviour brought about via interventions, and a greater proportion of intention”. The theory was used in several studies (e.g., Taylor and Todd, 1995b; 1995c; Limayem et al., 2000).

The three main constructs which were found to affect an individual’s intention towards behaviour were Attitude towards behaviour, Subjective Norm and Perceived Behavioural Control (Figure 2-1). Direct observation of cross-case studies and self-reporting were used. The three main constructs were found to be central to understanding human behaviour and enable researchers to predict future behaviour. Perceived Behaviour Control refers to when an individual has less control over a certain behaviour. It varies across different situations. The author contended that past behaviour can be used to predict future behaviour. According to the theory, perceived control over behaviour greatly increases when there are fewer obstacles and more resources available (Ajzen, 1991). This can be applicable to technology adoption, as individuals can be more able to adopt and use a certain technology when there are more resources available for them. The theory emphasises the importance of external factors, such as Subjective Norms, where social factors play an important role. Subjective Norms are influenced by communication and messages targeted towards the individual's attitudes for certain behaviour.

Figure 2-1: Theory of Planned Behaviour



Source: Ajzen, 2006

Ajzen (2006) found that there are three constructs that can affect intention: Attitude towards behaviour, Subjective Norm and Perceived Behaviour Control (PBC). The three constructs influence Intention, which, in turn, mediates their effect on Behaviour. Each of the three constructs is influenced by a certain type of belief which acts as its antecedent. Behavioural beliefs are antecedents of attitude towards behaviour. They refer to the individual's beliefs on the outcomes and consequences of performing a certain behaviour, whether positive or negative. Normative beliefs are antecedents of Subjective Norms which are perceived behavioural expectations of referents (groups) surrounding the individual (whether they think that they should or should not conduct a behaviour), combined with the individual's own motivation to comply with these referents. The combination of these two forms the Subjective Norm. Control beliefs are antecedents of Perceived Behaviour Control (PBC). They refer to the individual's beliefs about the presence of the factors that can facilitate or hinder performing a behaviour. Actual behaviour control was also included and refers to the level to which the individual possess the skills, resources and other facilities to perform a certain behaviour. The author found that PBC, as well as Intention, have an effect on behaviour (Ajzen, 2006). The author also stated that Intention diminishes when the expectations prior to usage are not met. If these expectations are met, Intention towards behaviour remains the same.

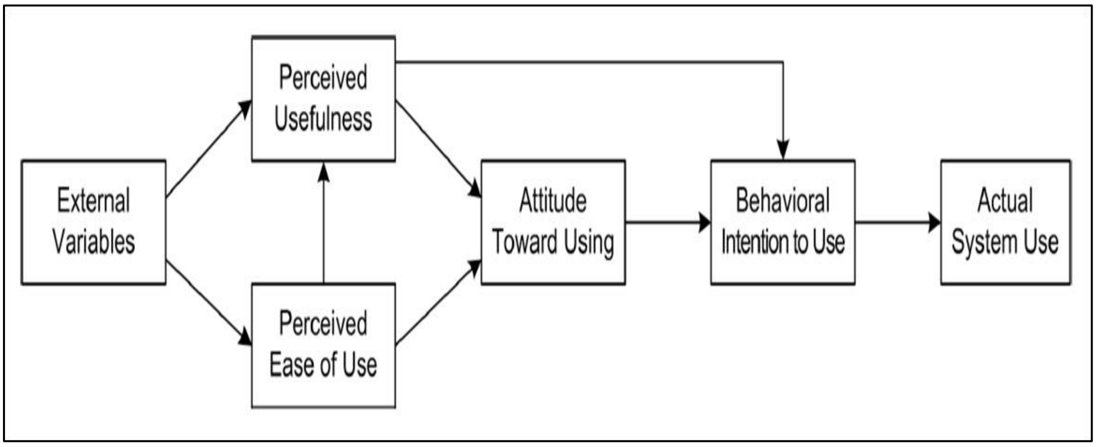
According to Abraham and Sheeran (2003), TPB has two main advantages. First, the small number of variables in the model make it easier to measure. Second, the theory allows researchers to accurately measure the constructs specified in the model and that they are compatible. Although TPB has been widely used in technology adoption research, the theory has its own limitations and has also been criticised. Taylor and Todd (1995a) stated that both TRA and TPB require or assume that individuals are motivated to perform a task, which may not be true. Furthermore, Perceived Behaviour Control was used to account for all the elements that cannot be controlled but are part of the behaviour. These specific elements were not identified and this may have introduced bias. Lynne et al. (1995) made a similar statement. Another limitation of both TRA and TPB is that both theories assume that an individual's behaviour is always rational and can be predicted based on specific criteria, which may not be the case (Sarosa, 2009). Within the context of technology adoption, the decision to develop a new behaviour is dependent on the original intention to use it. However, other external factors can control a user's behaviour and may have a greater influence on behaviour (Ajzen, 1991). A combination of internal factors (motivation) and external factors is required. In addition, the constructs included in both TRA and TPB are not sufficient to predict intention and behaviour. According to Sarosa (2009), TRA and TPB can only explain 40% of variance in behaviour, and this can be improved. The next section discusses the Technology Acceptance Model (TAM), which is arguably one of the most robust and cited theories within the context of technology acceptance.

2.2.3 Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM) was developed in the 1980s by Davis (1989). The author explored the fundamental determinants of user acceptance of computers. The work of TAM stemmed from the Theory of Reasoned Action (TRA) which was related to individuals' behaviour (Kwon and Chidambaram, 2000). The model has evolved over the past 27 years. It has been used by a substantial number of academics (Shih, 2004; Jan and Contreras, 2011; Tsai et al., 2011; Hong et al., 2011) and applied to different settings. The model has also been modified and new constructs added. It has been applied to testing the acceptance of different technologies in different settings, and data collected have come from a variety of participants from various cultures and backgrounds.

During the study, Davis (1989) tested users' acceptance of using a computerised mail system and file editor, as well as IBM PC-based graphics systems for testing the variables. Two different methods of testing took place. The study was applied in an organisational setting. The first study included 112 staff members of an organisation with six months' experience of using the system. The second study included 40 students using the two systems for the first time. Based on the findings, the main determinants of technology adoption were Perceived Usefulness (PU) and Perceived Ease Of Use (PEOU). PU was defined as the degree to which a person believes that using a particular system would enhance their job performance (Davis 1989). PEOU was defined as the degree to which a person believes that using a particular system would be free of effort (Davis, 1989). The findings indicated that PU was a stronger driver of technology adoption. PU and PEOU affect an individual's attitudes towards using technology systems which, in turn, is a major determinant of actual system usage (Davis, 1989). Overall, TAM was able to explain 40% of the variance in use. Although TAM was tested on employees and students and most of the selected participants were familiar with computer systems, it can still be applicable to the individual user with no prior experience of using technology systems.

Figure 2-2: Technology Acceptance Model

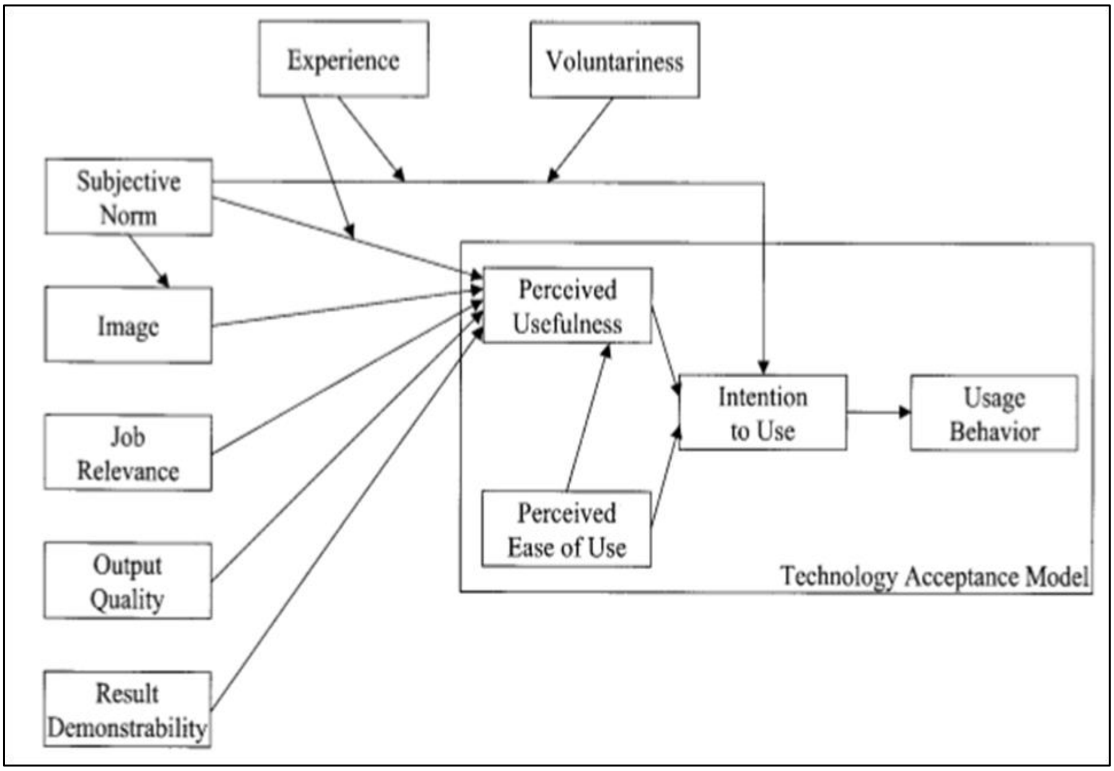


Source: Davis et al., 1989

Davis et al. (1989) compared TAM to TRA (Fishbein and Ajzen, 1975) in terms of intention prediction (Figure 2-2). The authors found that TAM can work better in terms of technology adoption, as it is less complex than TRA and less costly. TAM is one of the most robust models, which has been validated by a significant number of studies due to its power in predicting technology adoption (Saloman and Salman, 2013). Mathieson (1991) compared TAM to TPB (Ajzen, 1985), which was also similar to TRA (Fishbein and Ajzen, 1975; Ajzen and Fishbein, 1980) with minor differences. The results of the research showed that both models are able to explain and present intention to use the system. Whilst TAM is simpler and less costly, TPB is able to explain user intention further and provide more accurate information, due to its complexity (Mathieson, 1991). Although Subjective Norm (SN) was significant in TRA, it was not significant in TAM. However, Davis (1989) recommended carrying out further research to investigate whether SN is relative.

Venkatesh and Davis (2000) further developed TAM to create TAM2 (Figure 2-3) which was also purely developed in an organisational setting (for employees). The authors added SN as one of the main constructs in the model. They explained that SN is not important in voluntary settings, while it has a direct significant effect on intention in mandatory settings. While from the perspective of the present research, voluntariness is not related to the individual consumer's case (Venkatesh et al., 2012), it is possible that SN is important to the individual Arab consumer case. This is mainly due to the characteristics of the Arab culture (discussed in Section 3.3). Venkatesh and Davis (2000) further contended that the influence of SN decreases with an increase in the individual's experience.

Figure 2-3: The Extended Technology Acceptance Model



Source: Venkatesh and Davis, 2000

The underlying principle of TAM2 was to understand the difference between work goals and the outcomes of using a system, and using it to decide the extent of the system's perceived usefulness. Venkatesh and Davis (2000) added new constructs that can predict BI with PU during their extension of TAM to develop TAM2. The antecedents of PU and BI cover two types of processes to explain changes in the acceptance of technology as the experience of users increase. First, constructs covering social influence processes (Subjective Norms, Voluntariness and Image). Second, constructs covering cognitive instrumental processes (Job Relevance, Output Quality, Result Demonstrability and PEOU). Voluntariness is a moderator in TAM2 and refers to whether an individual is in voluntary or mandatory compliance within an organisational setting. Experience was theorised to affect the relationships between SN and PU and SN and BI.

Venkatesh and Davis (2000) explained that SN can affect BI via the mediating effects of PU based on the process of internalisation. They contended that the mechanism of internalisation takes place instead of compliance whether the user is in a voluntary or mandatory setting. Kelman (1958, p.54) categorised three types of process related to social influence, including "compliance", when the user is concentrating on the end goal of using the system, which can lead to gaining rewards or avoiding being behind or punished, "Identification", when the user uses a system in order to start or keep a connection with someone important to them, and "internalization", when the system is consistent with the users' own values. Therefore, the user accepts using it. While the former two influences (compliance and identification) are not related to the content of behaviour, the latter (internalisation) is related to the actual content of the behaviour (Kelman, 1958).

Kelman (1958) contended that the actions that arise as outcomes of these processes are different and need to be analysed, especially in international studies. While compliance was found to affect attitude towards usage negatively directly and behavioural intention indirectly, identification and internalisation (together) were found to positively influence attitudes directly and behavioural intention indirectly (Malhotra and Galletta, 1999). However, the authors used organisational settings and the sample used contained employees from different organisations. The compliance process may not be applicable to public users, as accepting and using new IT systems becomes voluntary.

Within the context of this research, both identification and internalisation are taken into consideration. Within the identification process, SN will have a positive influence on image, which was originally introduced by Moore and Benbasat (1991). Image was defined as "the degree to which use of an innovation is perceived to enhance one's image or status in one's social system" (Moore and Benbasat, 1991, p.195). TAM2 proposed three other constructs which form the match or comparison between job goals and system use outcomes, including Job Relevance, which Venkatesh and Davis (2000, p.191) defined as "an individual's perception regarding the degree to which the target system is applicable to his or her job", Output Quality, whether the system can perform the tasks that are required to achieve the job goals, and Result Demonstrability, which was also originally introduced by Moore and Benbasat (1991, p.203), who defined it as "tangibility of the results of using the innovation". TAM2 was able to explain 60% of variance, which is considerably higher than the original TAM.[1] Interestingly, the authors found that SN has a significant direct effect on BI. In addition, in mandatory settings, interactivity was observed between Job Relevance and Output Quality. The authors found that the effect of PEOU decreases over time as the experience of users increases. Furthermore, the authors found that as experience

[1]Although TAM2 was an improvement in comparison to the original TAM and provided a clearer view of the antecedents of PU and PEOU, the limitations inherited from TAM still remained, including self-reporting and the assumption that BI is the only determinant of Actual Use (USE), which may not be true as there could be other factors that can directly affect USE which users have no control over. More importantly, Venkatesh and Davis (2000) examined the new constructs as antecedents of PU rather than including them as possible antecedents of BI. A further step was undertaken by Venkatesh et al. (2003) (discussed in Section 2.2.9) to develop UTAUT, which was able to overcome some of these limitations.

increases, users pay less attention to social information but the significance of usefulness based on status benefits obtained from its use remains high. The authors found that Subjective Norms have a direct significant effect on BI in mandatory settings. The relationship between PEOU and PU was also empirically supported in Venkatesh and Davis' (2000) study. PEOU was found to have a direct significant effect on and could explain PU in later studies, too (Park et al., 2009; Son et al., 2012).

PU is a significant determinant of technology adoption (Davis, 1989; Davis et al., 1989; Taylor and Todd 1995b; 1995c; Igbaria et al., 1996). It was also found the most significant determinant of BI towards camera mobile adoption (Rouibah et al., 2011). In fact, it was found to be more significant than PEOU in many studies (e.g., Keil et al.,1995; Son et al., 2012). However, Igbaria et al. (1997) found that during the systems use life cycle, there are some points (precisely when starting to use the system) where PEOU has a more significant effect on usage than PU. Karahanna and Straub's (1999) findings were also consistent with these findings. The authors emphasised that training and support are important only at the beginning, then their effect starts to diminish gradually as experience increases. PU is certainly one of the most significant factors in TAM. However, the level of its significance in comparison to PEOU changes at the different points of system use.

PU was found to be equally significant among men and women (Terzis and Economides, 2011). Davis et al. (1989) found that PU can directly affect users' intention (which has a direct effect on actual usage) to use a system without the need for Attitude to mediate the relationship. Later, PU was found to have a direct effect on system use (Davis, 1993). Venkatesh and Morris (2000) found that PU was more significant for men than women, while women were more influenced by PEOU and SN. Nysveen et al. (2005a) reached similar conclusions when stating that PEOU has an important effect on Intention in the case of accepting mobile services, in particular for women and older users. Furthermore, PEOU was also found to be significant in the case of users in developing countries (Park et al., 2009). Akour and Dwairi (2011) found that the availability of the required facilitating conditions (i.e., resources) is a strong determinant of computer usage.

A substantial number of studies in the existing body of literature have suggested that the two main constructs of TAM along with user intention can be applied successfully to explain the acceptance and usage of mobile phones (Tsai et al., 2011; Son et al., 2012). The study conducted by Davis and Venkatesh (1996) concluded that PU and PEOU are valid and reliable. Davis et al. (1989) and Adams et al. (1992) found that these two constructs are able to explain system acceptance among different applications, with PU having a stronger influence on actual usage. This argument was supported by Davis (1993). Nevertheless, it can be argued that technology acceptance varies across different IT systems as well as individuals (Straub et al., 1997). In summary, although different researchers have had different opinions and findings on the types of relationships that exist between PU, PEOU and BI, these three constructs remained significant and empirically validated in the majority of these studies.

Webster and Martocchio (1992) stated that Enjoyment is related by a large extent to Perceived Complexity. Kwon and Chidambaram (2000) explained that there are two types of motivation, Extrinsic Motivation, which refers to PU (e.g., job performance), and Intrinsic Motivation, which refers to Enjoyment. Ease of use and apprehensiveness had significant effects on Intrinsic Motivation, while enjoyment itself was not found to be significant as the respondents of the research stated that they do not enjoy using mobile phones. However, this may not be the case for the new generation of mobile phones (smartphones), where a substantial number of mobile applications and games as well as other activities are available for the user. The old cellular mobile devices' sole purpose was to contact others by phone anywhere, anytime, providing mobility, and they were limited to calls and text messages (Lacohée et al., 2003). The revolution of smartphones started during the 2000s, precisely when the Apple iPhone in 2007 became popular (www.techhive.com, 2014).

Kwon and Chidambaram (2000) found that age was the only one of the three main demographic factors included in the study which proved to be significant. Nysveen et al. (2005a) contended that Perceived Enjoyment has a critical influence on Intention when using mobile services. Perceived Enjoyment was not included in some studies related to the adoption of smartphones (e.g., Park and Chen, 2007; Kim, 2008) as they applied their research to employees in organisational settings. In the case of the individual user, it is possible that Enjoyment as well as PU have significant effects on how they adopt and use the latest generation of mobile phones, smartphones.

Rose and Straub (1998) emphasised that cultural factors must not be neglected when attempting to understand technology adoption. One of the main shortcomings of the study conducted by Rose and Straub (1998) is that the data were tested and analysed in general, across different Arab countries, without carrying out an internal analysis of the level of applicability of TAM in each individual country in the studied five countries and comparing the results before gathering the final results. Park et al. (2009) emphasised that for the case of users in developing countries, English literacy is an important factor that affects ease of use, along with experience and system characteristics. The authors contended that PU and PEOU work differently in TAM depending on the specific external variables within the research setting (Park et al., 2009). This emphasises the fact that when studying technology adoption in developing countries, more specifically the Arab countries, external factors must not be neglected.

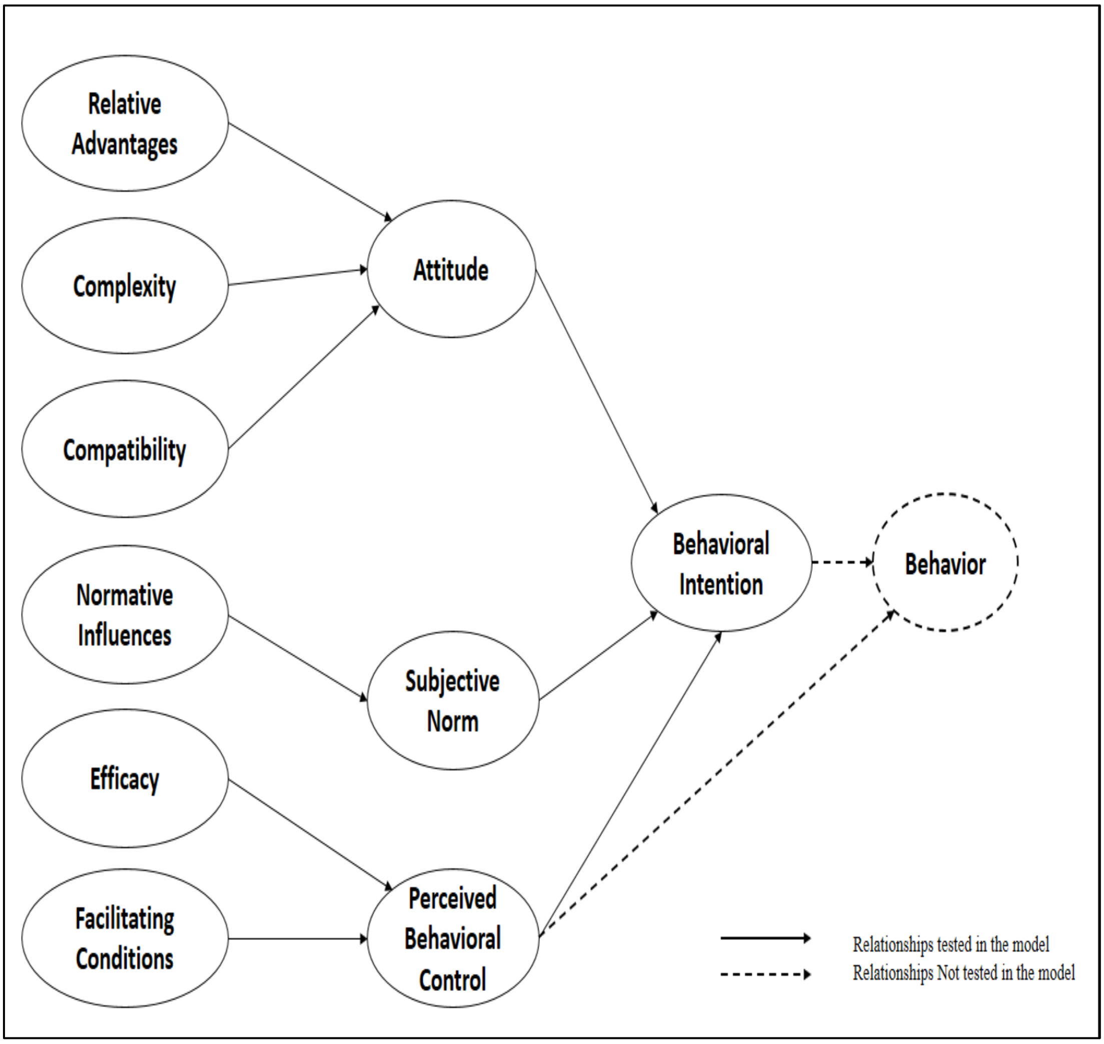
These are the external factors surrounding individual users in their own settings. The analysis of the factors must be studied in each Arab country separately.

The analysis of the literature conducted in this section shows that TAM is a robust model. However, TAM, on its own, is insufficient to predict an individual's adoption of technology, as its constructs are too general (Fang et al., 2005; Rouibah and Hamdy, 2009) and it does not take into account other important factors (Igbal and El-Gohary, 2014). Most research carried out in the past was on actual users who were either at the beginning of system usage or a later stage of use (e.g., Kwon and Chidambaran, 2000). From the perspective of this research, the model does not include the factors that surround the individual in real-life conditions, for example: facilitating conditions, social influence, social status, culture and level of technological development. The model is abstract and does not take into account the external atmosphere which can affect a user's adoption decision. In order to overcome the limitations in both TPB and TAM, Taylor and Todd (1995c) conducted a study which combined both theories to develop a better understanding of technology acceptance. This is discussed in the next section.

2.2.4 Combined TAM and TPB Model (Augmented TAM)

Taylor and Todd conducted three studies in 1995. The first study decomposed the TPB (DTPB), the second study compared TAM to TPB and finally, the third study combined TAM and TPB in order to develop Augmented TAM (A-TAM). Taylor and Todd (1995a) decomposed the constructs of TPB into components which allowed the expansion of TPB by including constructs from the Diffusion of Innovation (DoI) model (Rogers, 1983) (as shown in Figure 2.4 below).

Figure 2-4: Theory of Planned Behaviour with Belief Decomposition

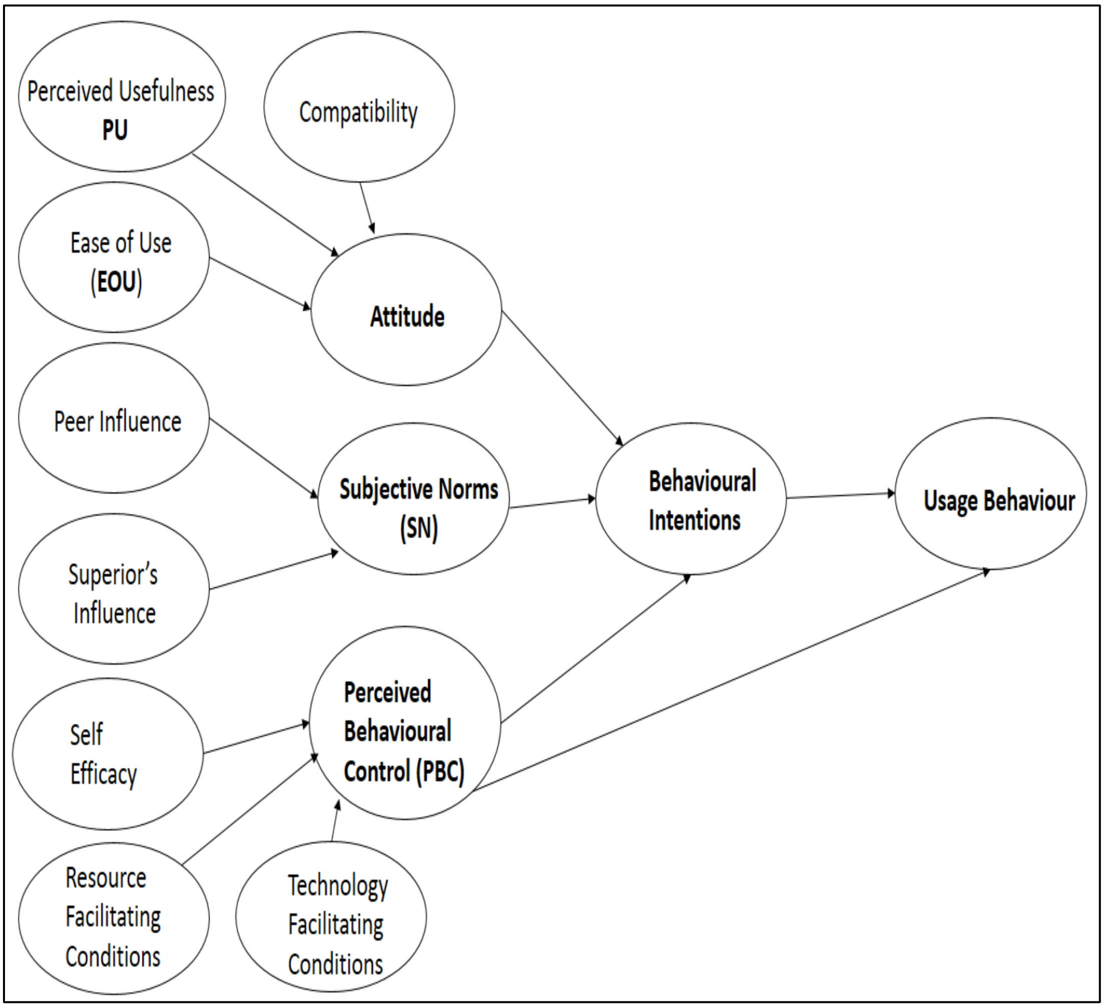


Source: Taylor and Todd, 1995a

The decomposition was conducted on the three types of belief, including attitudinal, normative and control beliefs, which stemmed from TPB. Attitudinal beliefs were decomposed into three constructs from the DoI model, including Relative Advantage (RA), Compatibility and Complexity. Relative Advantage was analogous to PU from TAM and Complexity was inverse-analogous to PEOU in TAM. Compatibility in DoI refers to the extent to which an innovation is compatible with the needs and prior experiences of individuals (Rogers, 2003). Normative beliefs were decomposed into referent groups which influence the individual user's decision to accept or reject the use of technology. The referents in their study were family and friends, as the participants were 790 customers in malls. Control beliefs (PBC) were decomposed into Self-Efficacy (SE), which refers to the internal control of the individual user (i.e., the individual's belief that they can perform the task) and external control (FC), which refers to the environment surrounding the individual user and whether it hinders or supports the performance of the task. The construct SE was originally found in Social Cognitive Theory (SCT) (discussed in Section 2.2.7). All the theorised relationships were supported in the study. In addition, crossover effects from normative structure to attitude and FC to SN were found. Compatibility and RA loaded together, which was consistent with the findings of the earlier study conducted by Moore and Benbasat (1991), so they were combined. This combination (RA and Compatibility) had an effect on PBC in their study. The authors concluded that DTPB helped in increasing the understanding of the relationships between the decomposed belief structures.

Taylor and Todd (1995b) also compared TPB and DTPB to TAM (Figure 2-5) to analyse how they contribute towards understanding how information systems are used. The findings indicated that the models are compatible in terms of their fit and predictive power, and they were found comparable. Both TPB and DTPB had an increased explanatory power in comparison to TAM when BI was taken into consideration. From the perspective of Taylor and Todd (1995b), TPB and DTPB have an extended theoretical power due to the variety of constructs included in them in comparison to TAM, which only included PU and PEOU. These two constructs were presented in TPB and DTPB as RA and Complexity. In addition, while TAM is less costly and can provide guidance to system designers, TPB and DTPB aid system designers and highlight other aspects surrounding users, including normative beliefs and FC as well as the individual's internal control belief represented by SE.

Figure 2-5: Decomposed Theory of Planned Behaviour

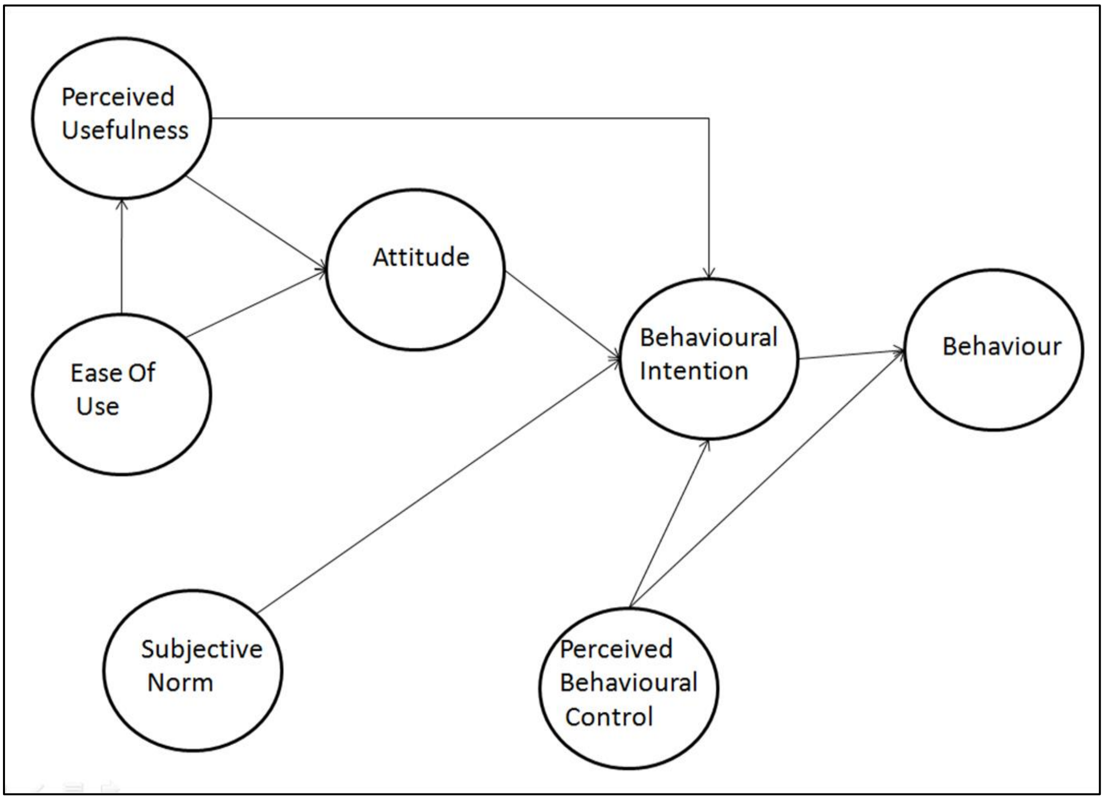


Source: Taylor and Todd, 1995b

Consequently, Taylor and Todd (1995c) combined TAM (Davis, 1989) and TPB (Ajzen, 1985;1991) to create Augmented TAM (A-TAM). The model was subsequent to the earlier study carried out by Taylor and Todd (1995b) which compared TAM and TPB. The reasons behind creating A-TAM was that TAM was mainly used by systems that users were already using or familiar with and lacked the two factors SN and PBC which were found significant in previous studies (Moore and Benbasat, 1991; Taylor and Todd, 1995b). Therefore, the authors tested the model with inexperienced users to examine the differences.

The A-TAM model combined both TAM and TPB to create a new model to better understand participants' behaviour. The developed model was used to test the drivers of IT usage by inexperienced users, understand their behaviour towards IT usage and compare them to experienced users. A sample of 430 experienced users and 356 inexperienced 'potential' users of technology systems was used. The model was applicable for both experienced and inexperienced users. There were many differences in behaviour between experienced and inexperienced users. Experience (past behaviour) is an important factor that influences current behaviour via its effect on ease of use, and it can be used as a tool to predict future behaviour (Bajaj and Nidumolu, 1998). Taylor and Todd (1995c) found that adding TAM and the decomposed TPB (Figure 2-6) can explain IT usage, by incorporating the three main factors. The authors found that the inclusion of SN, Attitude towards behaviour and PBC is better than using TAM alone. BI was higher among experienced users. PU and PEOU were less significant among experienced users. In contrast, PU and PEOU were more significant for inexperienced users. The path between PBC and BI was more significant among experienced users, while SN was not significantly different between the two groups. In addition, the path from PEOU to PU was insignificant in both groups.

Figure 2-6: The Augmented Technology Acceptance Model



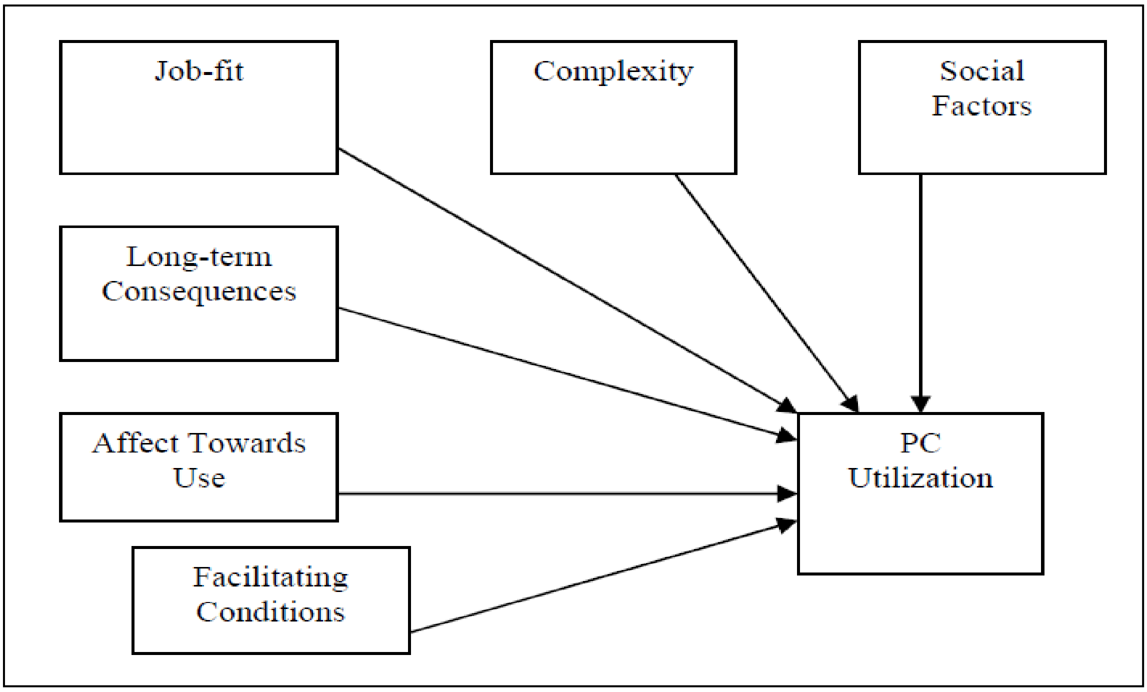
Source: Taylor and Todd, 1995c

A-TAM was applicable for inexperienced users. Providing information to users without prior experience has a significant effect on intentions (Taylor and Todd, 1995c). It can be argued that level of education and knowledge can reduce uncertainty up to a certain level (Göğüş et al., 2012). The more experience users have, the less important ease of use becomes (Wu and Wang, 2005). Park et al. (2009) found that experience has a direct effect on ease of use in the case of users in developing countries. The authors stated that their findings supported earlier studies such as Thong et al. (2002), in that the design of ICT systems must be user-centric and must meet the user's needs and expectations. This proves to have an important impact on ease of use. The model shows that when studying technology acceptance, differences between users with prior experience and users with no experience must not be neglected. They must be accounted for when studying technology adoption, specifically in this research. Although A-TAM was an improvement on the original TAM, it has a number of limitations. Students were used as participants to test the model. In addition, other factors can be as important as experience, such as age, gender and education, which were not tested in this model. The next section discusses the Model of PC Utilisation (MPCU).

2.2.5 Model of PC Utilisation (MPCU)

The Model of PC Utilisation (MPCU) was developed by Thompson et al. (1991). The model was mainly based on Triandis' (1977; 1979) Theory of Human Behaviour, with some improvements in order to be used to predict PC (Personal Computer) Utilisation. Unlike other theories, the model was used to predict usage instead of behavioural intention. The main constructs in MPCU as defined and tested by Thompson et al. (1991) were Job Fit (the level to which the use of PCs can help to support the performance of the individual's job), Complexity (negative relationship between Complexity and usage), Long-Term Consequences (the future outcomes of using the system which become weaker when time goes by), Affect towards use (emotional effects associated with the individual during usage such as joy, pleasure or hatred), Social Factors (individual's norms and values which depend on the opinions and norms received from other people surrounding the individual) and Facilitating Conditions (Thompson et al., 1991) (as shown in Figure 2.7 below). Another important factor discussed in Thompson et al.'s (1991) study is Habit, as the authors acknowledged its importance in PC Utilisation. However, the authors did not include it in their analysis as a construct, as they found it hard to measure.

Figure 2-7: The Model of PC Utilisation



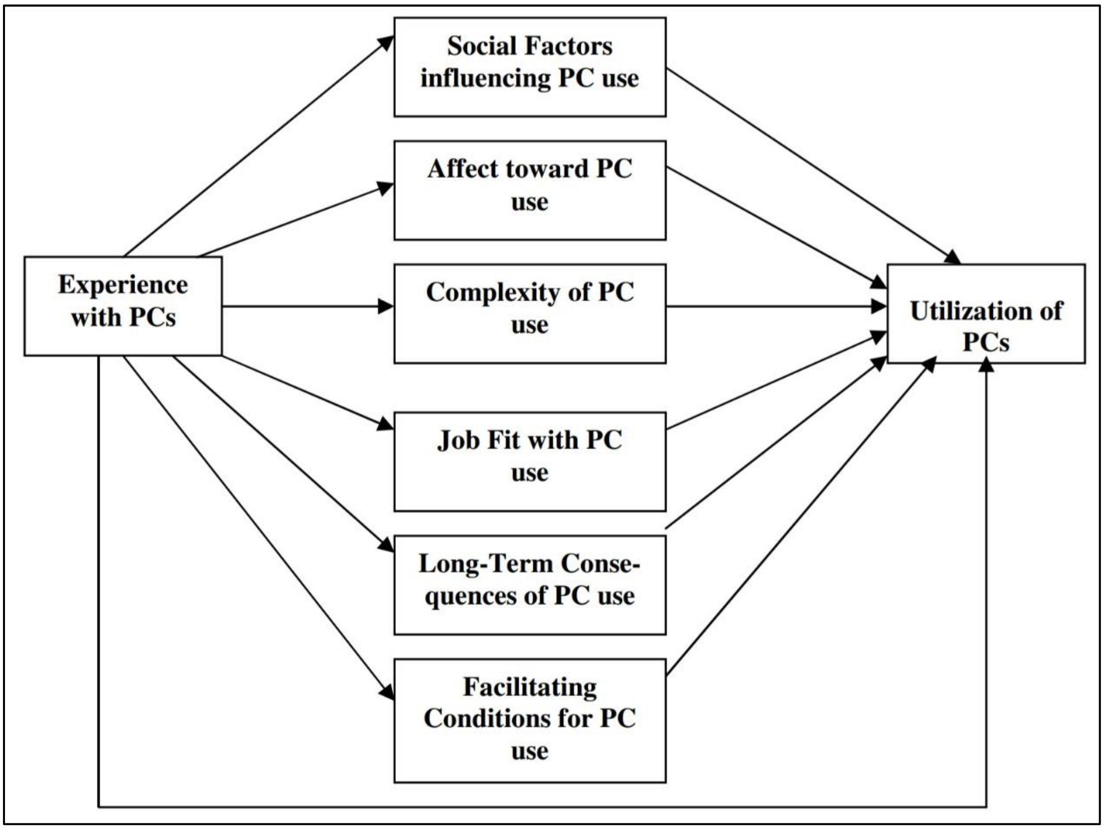
Source: Thompson et al., 1991

While the other factors proved to be significant for knowledge workers, Affect and Facilitating Conditions were not found significant for PC users. However, Thompson et al. (1991) stated that they only tested one aspect (measure) of Facilitating Conditions, which could be the reason behind not finding a significant relationship between Facilitating Conditions and PC Utilisation. The authors found that Job Fit has the strongest influence on PC Utilisation, stronger than Complexity.

In a later study, Thompson et al. (1994) extended the model developed in their earlier study in order to gain a deeper understanding of their original model. Experience With PCs was included in the new model. Experience was found to have a direct effect on the utilisation of PCs. The relationship between Experience With PCs and PC Utilisation was also mediated by a number of factors (as shown in Figure 2-8), including Social Factors influencing PC use, Affect towards PC use, Complexity of PC use, Job Fit with PC use, Long-Term Consequences of PC Use and Facilitating

Conditions. Based on this study, it can be argued that the role of prior experience and the benefits obtained from using a technological product are crucial in technology usage, which may also apply to the case of the individual Arab user.

Figure 2-8: Factors affecting the Utilisation of Personal Computers



Source: Thompson et al., 1994

Although the Model of PC Utilisation was originally developed for and tested on knowledge workers using computers, some aspects of the theory, particularly Facilitating Conditions, Social Factors, Affect (enjoyment) and Habit can still be applicable to the case of individual Arab users of mobile phones. The next section provides a discussion on the Motivational Model, which has also proved to be significant within the existing body of literature related to technology adoption.

2.2.6 The Motivational Model (MM)

Davis et al. (1992) used the work conducted by Deci (1971; 1972; 1975), in which intrinsic and extrinsic motivation were identified as key drivers of conducting a behaviour, to understand technology adoption and use and developed the Motivational Model. The authors divided motivation into extrinsic motivation and intrinsic motivation. Extrinsic motivation refers to the view that users will want to perform an activity "because it is perceived to be instrumental in achieving valued outcomes that are distinct from the activity itself, such as improved job performance, pay, or promotions" (Davis et al., 1992, p.1112). On the other hand, intrinsic motivation takes place "for no apparent reinforcement other than the process of performing the activity per se" (Davis et al., 1992, p.1112). This type of motivation is related to the user's views of enjoyment (Davis et al., 1992). The user in this case, therefore, does the activity for no other benefit rather than just doing the activity itself (Davis et al., 1992). This shows that the user might be doing certain tasks on their mobile phone (some of the mobile applications) with no outcome expectation other than the enjoyment of just doing the task itself. Davis et al. (1992) found that both intrinsic and extrinsic motivation affect Behavioural Intention. Igbaria et al. (1996) developed an integrated conceptual framework to test the Motivational Model and the constructs Perceived Usefulness, Perceived Playfulness and Social Pressure. The results of the study confirmed the importance of Perceived Usefulness as a key determinant of the use of computers. Enjoyment and Social Pressure were found significant, too. Perceived Complexity mediated the predictors Skills, Organisational Support and Organisational Usage with Perceived Usefulness, Perceived Enjoyment and Social Pressure.

Venkatesh and Speier (1999) developed their work based on the study conducted by Davis et al. (1992). The authors studied the effect of mood on intrinsic and extrinsic motivations to perform a task within an organisational context (workplace), as well as studying the effect of mood on Behavioural Intention. The researchers also investigated the effect of mood on motivation. Intrinsic motivation decreases at the later stages of training. The authors emphasised the importance of maintaining intrinsic motivation during the training of employees. Positive mood increases intrinsic motivation and intention to use technology. The effect of intrinsic motivation and therefore mood starts to diminish in the later stages of employees' training (i.e., after six weeks). However, if employees have a negative mood at the later stages of training, they are likely to keep the same mood and low intrinsic motivation throughout the training and use of the system, as it affects their intentions towards use. Both Venkatesh (1999) and Venkatesh and Speier's (1999) studies were longitudinal.

Davis et al. (1992) and Igbaria et al. (1996) explained that people's intentions towards system usage are influenced by the system's actual usefulness, followed by how enjoyable it is to use. Teo et al. (1999) found that Perceived Usefulness has a much stronger foundation in the case of the Internet user than enjoyment. Furthermore, the authors found that even enjoyable tasks have to provide actual usefulness, otherwise the user will not keep using them.

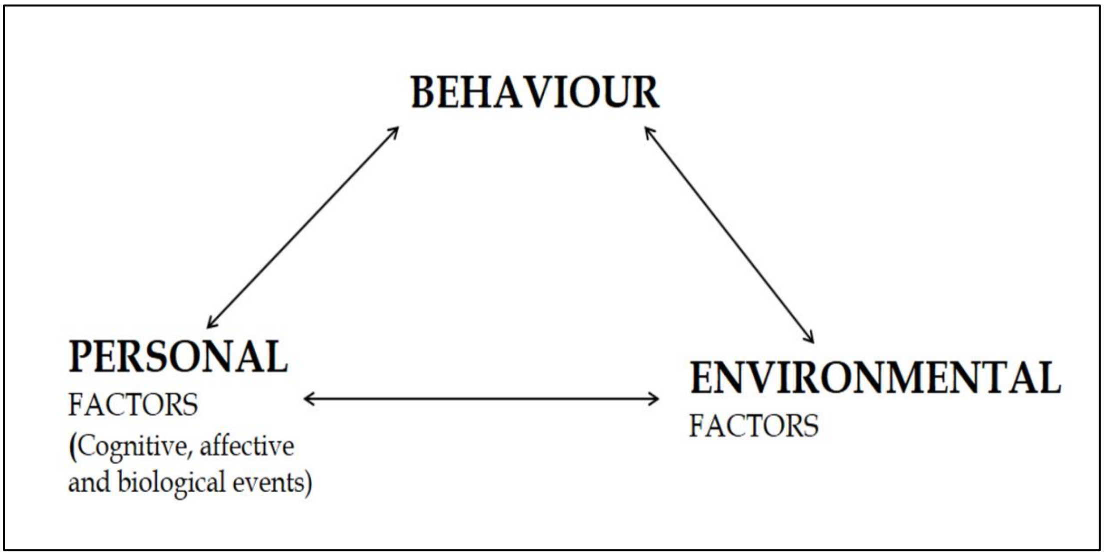
Although the application and development of the Motivational Model were mainly carried out in an organisational setting and tested with employees, it can be argued that the two types of motivation also apply to the individual's case. Based on the analysis of the literature conducted in this section, it can be contended that both intrinsic motivation (enjoyment) and extrinsic motivation (usefulness), although they both affect Behavioural Intention at different levels of significance, must be investigated in the case of the individual Arab user adopting and using a mobile phone. The next section provides an analysis of Social Cognitive Theory (SCT), which proved to be important in that it analyses the effect of Self-Efficacy and Outcomes, which are important for technology adoption and studied in IS research.

2.2.7 Social Cognitive Theory (SCT)

Social Cognitive Theory (SCT), originally developed by Bandura (1986), takes account of the factors that surround the user as well as personal factors and behaviours. The theory was based on Social Learning Theory (SLT), studied by Miller and Dollard (1941), in which three major elements for learning were identified: feedback on learning, observation and identification. A large number of studies have been based on SLT. However, Bandura (1986) introduced behaviour modelling, Self-Efficacy and the variations that can take place over time due to experience and social factors surrounding individuals. Social Cognitive Theory (Bandura, 1986) emphasises the significant influence of Self-Efficacy in both types of outcome. The theory was developed to understand the effect of communications on humans. It explains that someone’s behaviour is not an end product of the external factors surrounding them but the intrinsic nature of the individual also has a critical role in their behaviour. The theory emphasises the central role of the self-organising, proactive, self-reflecting and self-regulating nature of humans in addition to the external factors around them.

Bandura’s (1986) conceptual framework included three main variables: first, personal determinants in the form of cognition, second, behavioural determinants, and third, environmental determinants (Figure 2-9). Personal and environmental determinants can change behaviour and come in a triadic structure. These three factors affect human functioning. The theory was used to understand how people learn as well as how they can adopt technology. The theory emphasises that the role of the nature of each individual and their way of thinking cannot be neglected when studying human behaviour.

Figure 2-9: Social Cognitive Theory



Source: Pajares, 2002

Bandura (1986. p.15) stated that, "a theory that denies that thoughts can regulate actions does not lend itself readily to the explanation of complex human behaviour". However, within the new era of high-technology products, the effect of environmental determinants could be stronger than other types of determinants (Bussey and Bandura, 1999). Self-Efficacy was defined in Bandura's (1986, p.391) study as "people's judgements of their capabilities to organize and execute courses of action required to attain designed types of performance". This construct, in particular, is vital for many aspects of people's lives. It is also a major determinant of self-regulation, as it illustrates how people have control over their decisions, thoughts and behaviour.

The original Social Cognitive Theory (SCT) was used by Compeau and Higgins (1995a) to understand the acceptance and use of computers. The study was an extension of their earlier study (Compeau and Higgins, 1995b) which they conducted to study performance during training that can lead to effective computer use. The authors categorised outcomes into personal and performance-related outcomes. This stemmed from the understanding that the benefits of using computers are not limited to job-related accomplishments but also include personal benefits. The study confirmed the applicability of SCT in explaining humans' behaviour in computer use through integrating many factors including Self-Efficacy, Outcome Expectations-performance (related to job outcomes), Outcome Expectations-personal (self-esteem and sense of accomplishment), Affect (enjoyment associated with or liking of certain behaviour), Anxiety (negative feelings surrounding computers) (Compeau and Higgins, 1995a). The antecedents included in the model were Encouragement by Others (in other words, social influence), Others' Use (watching others perform the task, in other words, observation increases one's self-efficacy) and Support (organisational support).

Compeau et al. (1999) developed a model for technology acceptance based on SCT and found that performance-related Outcome Expectations and Self-Efficacy had a significant effect on individuals' reactions to information technology. Self-Efficacy was found to be related to Outcome expectations-performance, people's thoughts on the task and what they can obtain or achieve from conducting it (Compeau et al.,1999). The results of their longitudinal research confirmed the findings of the earlier study conducted by Compeau and Higgins (1995a) and the applicability of SCT. Outcome Expectations is similar to Perceived Usefulness in TAM (Davis, 1989), Relative Advantage in DoI (Rogers, 2003) and Performance Expectancy in UTAUT (Venkatesh et al., 2003).

Social Cognitive Theory (SCT) has formed an important part of other subsequent technology acceptance theories, such as UTAUT (Venkatesh et al., 2003). Whilst the theory is not easily applied to different situations, it has been successfully applied to the case of computer utilisation (Compeau et al., 1999). The theory was also mainly used for knowledge workers in an organisation. Carillo (2010) conducted a literature review on the use of SCT in IS research. The author stated that SCT relies on unidirectional relationships between the variables rather than the one-direction causality relationship adopted in TAM, DoI and TPB. The author also highlighted that the role of emotional factors must be considered more in IS research. The theory was included in UTAUT. However, Venkatesh et al. (2003) examined the model within the realm of Behavioural Intention instead of actual usage.

The main difference between SCT and other theories such as TAM, DoI and TPB is that it considers the significance of Self-Efficacy and acknowledges that even when all the supporting environmental factors are present, personal factors (apart from beliefs) play an important role in technology acceptance. However, Venkatesh et al. (2003) found that Computer Self-Efficacy becomes weaker then diminishes over time. Furthermore, the authors found that Computer Self-Efficacy, Anxiety and Attitude had no significant effects on BI. Therefore, they dropped them from their model. The authors stated that the insignificant effect of Computer Self-Efficacy was due to its effect being captured by Effort Expectancy (EE). The next section discusses the Diffusion of Innovation Theory (DoI) developed by Rogers (2003).

2.2.8 Diffusion of Innovations Theory (DoI)

The Diffusion of Innovation (DoI) theory developed by Rogers (1983; 2003) analyses the main elements of the diffusion of innovation among different types of users. The

DoI was based on the S-shaped diffusion curve theory developed by Gabriel Tarde (1903), which was used to measure the rate of adoption of innovations (Rogers, 2003). Rogers (2003) provided a detailed definition of the term ‘diffusion’, stating that “Diffusion is the process in which an innovation is communicated through certain channels over time among the members of a social system” (Rogers, 2003, p.5). Based on this definition, Rogers (2003) identified four main elements in the diffusion of innovation: the innovation itself, communication channel, time and social system. Rogers (2003) explained that the variance in the rate of the adoption of an innovation (49-87%) is determined by five attributes: Relative Advantage (RA), Compatibility, Complexity, Trialability and Observability (see Figure 2-10). These are explained as follows:

Relative Advantage: Rogers (2003, p.229) defined Relative Advantage as “the degree to which an innovation is perceived as being better than the idea it supersedes”. The advantages an innovation can bring can be economic (in terms of the product’s cost), social status (image) or both.

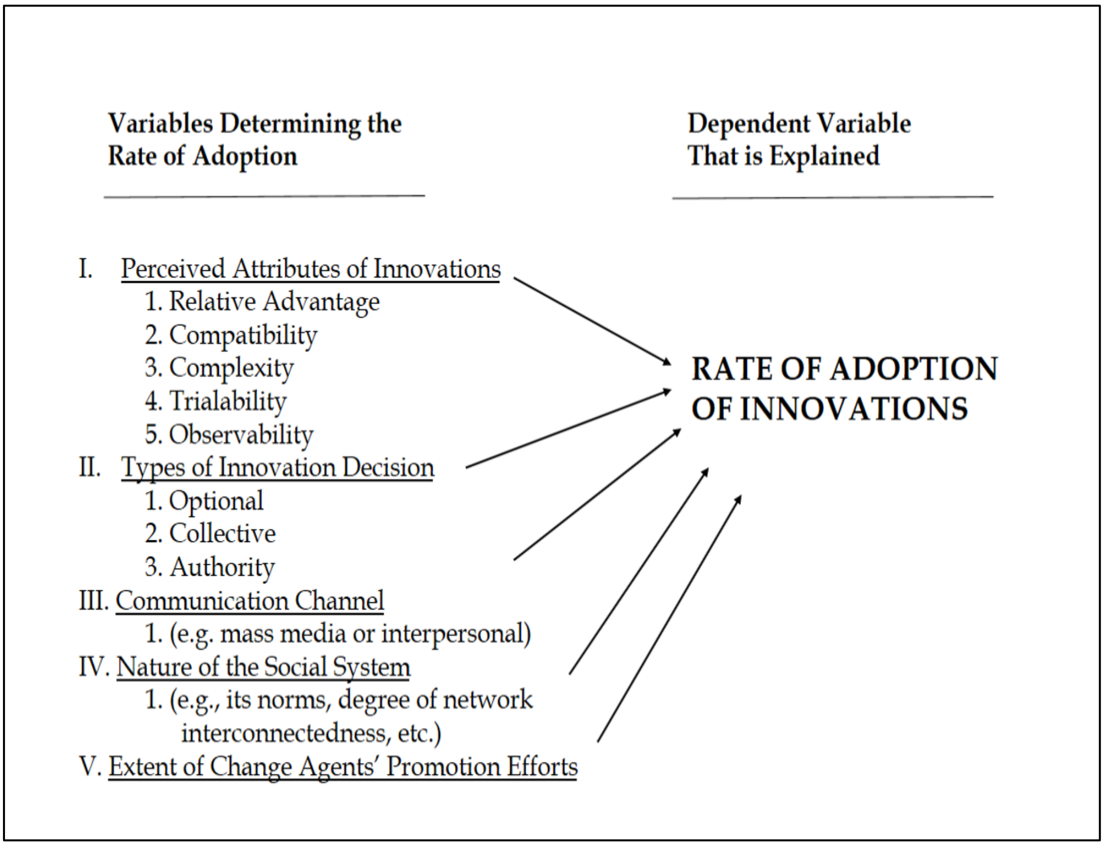
Compatibility: defined by Rogers (2003, p.240) as “the degree to which an innovation is perceived as consistent with the existing values, past experiences, and needs of potential adopters”. Compatibility is important because it reduces uncertainty about a certain innovation. Humans find it easier to process and comprehend a new experience if it is consistent with an old experience.

Complexity: defined as “the degree to which an innovation is perceived as relatively difficult to understand and use” (Rogers, 2003, p.257). This attribute refers to how easy the innovation is to use. It has a negative effect on the rate of adoption.

Trialability: defined as "the degree to which an innovation may be experimental with on a limited basis" (Rogers, 2003, p.255). When an individual tries a product, the level of uncertainty is reduced and this is therefore positively related to the rate of adoption, specifically if the product is designed to be easy to trial.

Observability: defined as "the degree to which the results of an innovation are visible to others" (Rogers, 2003, p.258). This attribute refers to whether the idea of an innovation can be easily communicated and observed. The easier it is to describe an innovation and observe it, the higher and faster the rate of adoption becomes.

Figure 2-10: Variables Determining the Rate of adoption of innovation



Source: Rogers, 2003, p.222

Moore and Benbasat (1991) studied the attributes of DoI and extended these attributes and the theory by including Result Demonstrability, Image and Volunteerness. The authors explained that the term Relative Advantage is more detailed than Perceived Usefulness. They also developed an instrument with 34 items with seven scales to measure the original five dimensions in DoI and the additional dimensions they included in their study. The authors combined Compatibility with Relative Advantage. Their study was one of the main extensions of DoI, and they recommended using their instrument in future studies.

The second element in diffusion is 'communication channels'. This refers to subjective norms and the influence others have on the individual's adoption decision-making. If influencers have similarities in certain attributes, it is likely that the connection will be effective.

The third element is 'time'. This element refers to two aspects, first, the steps of the innovation-decision process, second, the interactiveness with technology as time goes by. Rogers (2003) explained that over time, individuals go through five main stages[2] which constitute the innovation-decision process: knowledge, persuasion, decision, implementation and confirmation (Figure 2-11). However, the author contended that in eastern countries, the order of the first three steps can be knowledge, decision and persuasion (Rogers, 2003). This is mainly due to cultural differences, as peers'

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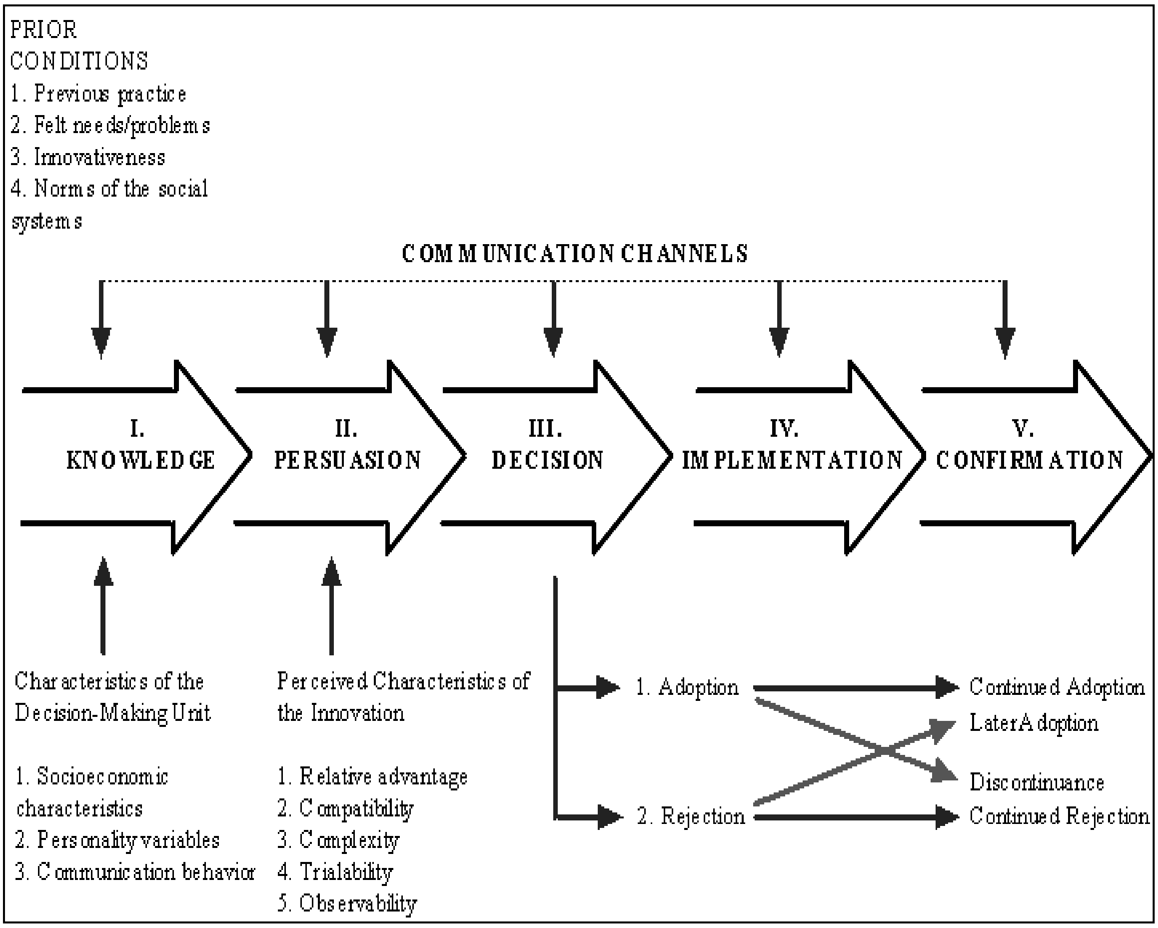
[2]

1) **The knowledge stage**: The stage when an individual becomes aware of the existence of an innovation and starts to understand how it works.
2) **The persuation stage**: Rogers (2003, p.174) stated "At the persuation stage in the innovation-decision process, the individual forms a favourable or unfavourable attitude toward the innovation".
3) **The decision stage**: the step in which an individual decides to adopt or reject an innovation.
4) **The implementation stage**: further to the decision to adopt an innovation stage, the innovation needs to be put in use.
5) **The confirmation stage**: the stage where an individual's adoption decision is confirmed as individuals decide on whether to continue or discontinue using the innovaton. There are two reasons that can lead to discontinuance. First, replacement, when an innovation is rejected as a better innovation or a better idea is found. Second, disenchantment, when the results of using the new product are not satisfactory.

influence (Subjective Norm) is stronger in eastern countries due to their collectivistic culture.

Figure 2-11: Model of Five Stages of the Diffusion Innovation Process



Source: Rogers, 2003, p.170

Rogers (2003) categorised five types of adopters[3] in accordance with the time of adoption: innovators, early adopters, early majority, late majority and laggards. Rogers (2003) distinguished between earlier and later adopters of an innovation. Early

[3]**Innovator**s: the group of individuals who are highly interested in new innovations and can afford to pay for them. They form the smallest group of members of the system. **Early adopters**: the group of people who are influenced by the innovators group by means of opinion leadership. **Early majority**: this group is between early adopters and late adopters. **Late majority**: this group adopts innovations just after the average members of the system. Here, subjective norms play an important role in motivating individuals to adopt an innovation. **Laggards**: groups of isolated users who are the last to adopt a technology and take a long time to decide to adopt an innovation, as they have a high level of resistance. They are usually the most sensitive users as they tend to have a limited economic level.

adopters (knowers) are usually on a higher education level, social status, exposure to mass media and interpersonal channels and are more socially involved and cosmopolite (Rogers, 2003).

The fourth element in diffusion is ‘a social system’. The social structure of the system and the relationships between an individual and others affect the diffusion of an innovation (Rogers, 2003). Rogers (2003) identified three types of innovation decision. First, optional innovation decisions, in which an innovator chooses to adopt an innovation without any influence from others. However, Rogers (2003) explained that even with this type of decision-making, individuals can be influenced by the norms of the system. Second, collective-innovation-decisions, in which the decision to adopt is taken in collaboration with all other members/ units of the system. Third, authority-innovation-decisions. These are the types of decisions which individuals make based on the decisions made by others who have authority over them.

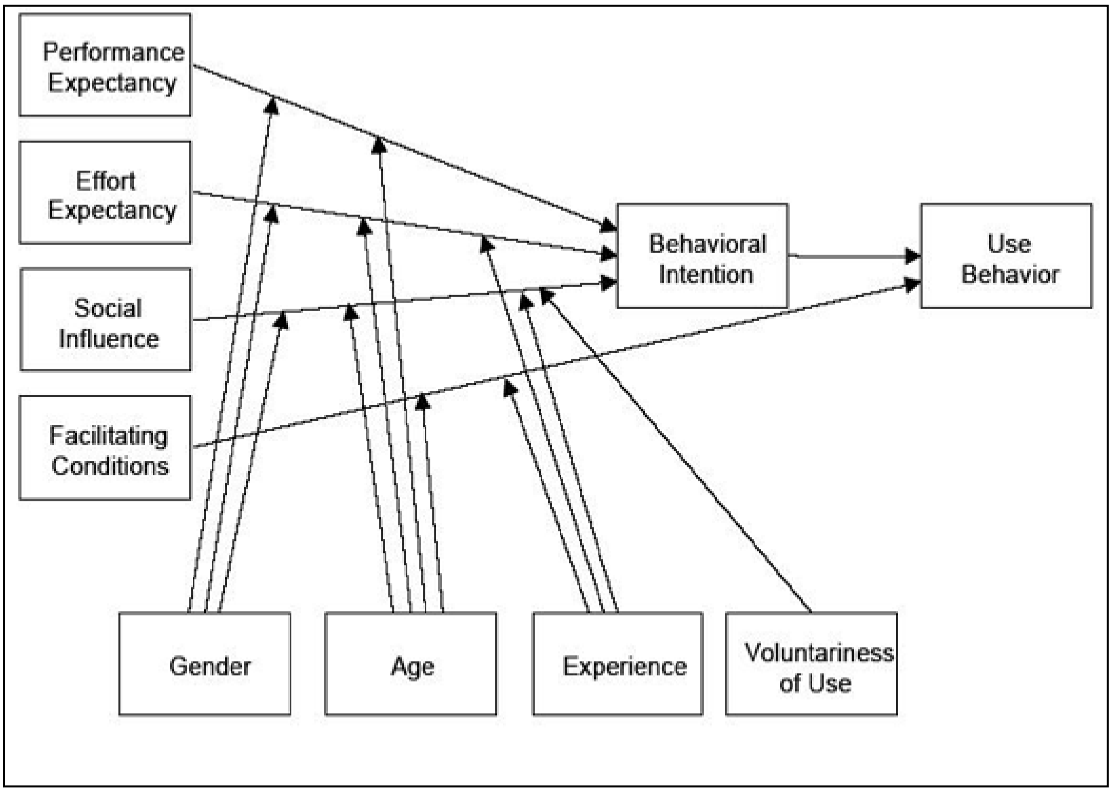
One of the main limitations of this theory is the high consideration for the external factors surrounding the individual user, more than the personal factors such as Intention, Attitude, Self-Efficacy or Affect (enjoyment) found in the Technology Acceptance (TA) theories. The next section provides a discussion and analysis of the Unified Theory of Acceptance and Use of Technology (UTAUT) developed by Venkatesh et al. (2003), which combined the most important theories related to technology adoption discussed in the earlier sections in this chapter and analysed them to create one unified model that applies to technology adoption.

2.2.9 Unified Theory of Acceptance and Use of Technology (UTAUT)

The first version of UTAUT was developed by Venkatesh et al. (2003). The main aim of their research was to integrate the fragmented theories of technology adoption into one unified model by identifying the most significant and relevant constructs from the previous well-known technology acceptance theories. The authors found similarities among the constructs used in previous theories. The model was built from an organisational point of view using organisational settings. It was built by comparing and testing eight main technology acceptance theories: Theory of Reasoned Action (TRA), Technology Acceptance Model (TAM), Motivational Model (MM), Theory of Planned Behaviour (TPB), Combined TAM and TPB, Model of PC Utilisation, Diffusion of Innovation Theory (DoI) and Social Cognitive Theory (SCT). The authors used a longitudinal study in four organisations with three points of measurement over six months, including post-training, one month after implementation and three months after implementation. The constructs of UTAUT emerged by gathering the applicable constructs of these models. The authors added important moderators including age, gender, experience and voluntariness. The Attitude, Anxiety and Self-Efficacy constructs were eliminated from this model as they did not have any significant effects on BI. Venkatesh et al. (2003) contended that intention has a significant direct effect on usage. On the other hand, the authors contended that attitude's effect on Behavioural Intention is not significant and empirically proved it. This was based on an earlier argument based on Davis et al.'s (1989) study, stating that Attitude can be found within the effect of Effort Expectancy (EE) and Performance Expectancy (PE).

The four main independent factors in UTAUT (as shown in Figure 2-12) were:

Figure 2-12: Unified Theory of Acceptance and Use of Technology



Source: Venkatesh et al., 2003

Performance Expectancy (PE): defined as "the degree to which an individual believes that using the system will help him or her to attain gains in job performance" (Venkatesh et al., 2003, p.447). PE was based on PU in TAM, TAM2 and A-TAM, Extrinsic Motivation in MM, Job Fit in MPCU, RA in DoI and Outcome Expectations in SCT. These constructs were found to be similar and they were represented by PE in UTAUT (Venkatesh et al., 2003). PE was found to have a significant effect on BI (Venkatesh et al., 2003). The effect of PE was stronger for males and younger workers.

Effort Expectancy (EE): defined as "the degree of ease associated with the use of the system" (Venkatesh et al., 2003, p.450). This construct represented several constructs in previous theories which Venkatesh et al. (2003) found to be similar, including

PEOU in TAM, A-TAM and TAM2 and Complexity in MPCU and in DoI. This construct was found to have a significant effect on BI, but this significance differed in accordance to the point of time at which the system was being used. In other words, it differed according to the level of experience users had in using the system. The effect of EE was stronger among females and older workers with a low experience level.

Social Influence (SI): defined as “the degree to which an individual perceives that important others believe he or she should use the new system” (Venkatesh et al., 2003, p.451). This construct is represented as Subjective Norms in TRA, TAM2, TPB, DTPB and A-TAM, Social Factors in MPCU and Image in DoI. This construct had a significant effect on BI. The effect of SI was stronger for females and older workers with a low experience level in mandatory settings.

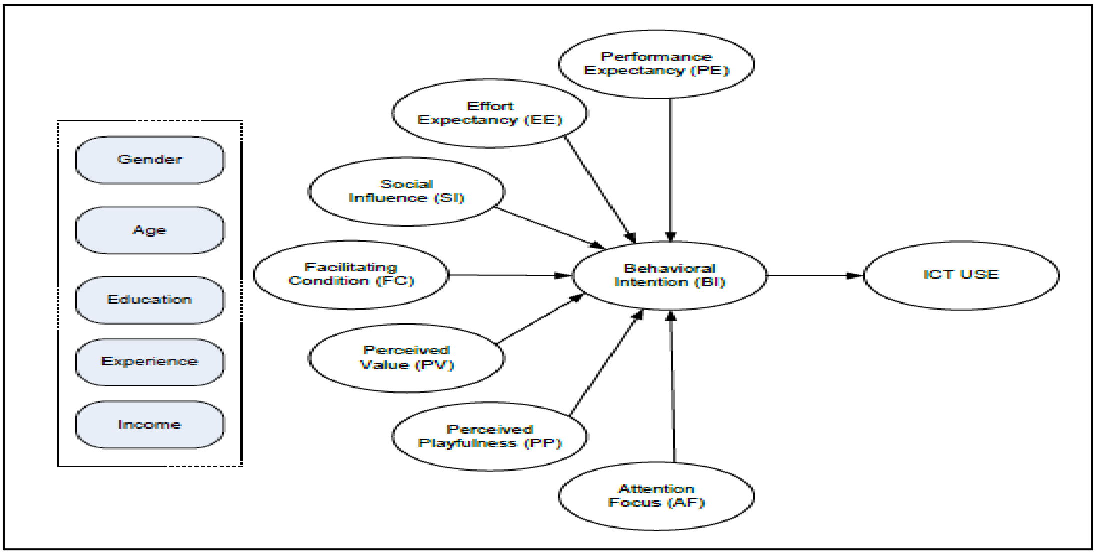
Facilitating Conditions (FC): defined as “the degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system” (Venaktesh et al., 2003, p.453). This construct represented PBC in TPB, DTPB and A-TAM, FC in MPCU and Compatibility in DoI. The authors contended that the significance of FC can be affected by EE. If EE is present and has a strong effect on BI in the model, FC will not have a significant effect on it. FC was found to have a significant effect on Use Behaviour. Dwivedi et al. (2011) noted that a larger number of studies found that FC has a significant impact on USE than found FC to have a significant impact on BI. The researchers called for further investigation into the effect of FC on BI. The effect of FC on usage was stronger among older workers with a high experience level.

Venkatesh et al. (2003) stated that social factors tend to be significant when starting IT usage. However, their effect gradually decreases when experience is gained.

Nevertheless, it could be the case that for users in the Arab world, these social factors remain significant for using new and existing IT products continuously. This is due to the collectivistic nature of the Arab culture (Hofstede, 2001).

Alwahaishi and Snášel (2013) developed a new model based on UTAUT which was found to be strongly related to the adoption of technology in Saudi Arabia (as shown in Figure 2-13). Other constructs were also included. The authors contended that the adoption of ICT in Saudi Arabia is high. PE, SI, FC, BI and Perceived Playfulness were strongly related to the case of the individual consumer in Saudi Arabia. Perceived Playfulness relates to perceived enjoyment, which proved to be significant in the case of mobile adoption in previous studies, e.g., Nysveen et al. (2005a), Khayyat and Heshmati (2013) and Kamel and Farid (2007). Alwahaishi and Snášel (2013) included five main demographic factors in their model: Gender, Age, Education, Experience and Income. Although for the case of Saudi Arabia as a country, the individual's income is considered high as it is rich in oil and other resources, income was also included as one of the demographic factors in Alwahaishi and Snášel's (2013) model. This shows that income and price are significant even in rich Arab countries.

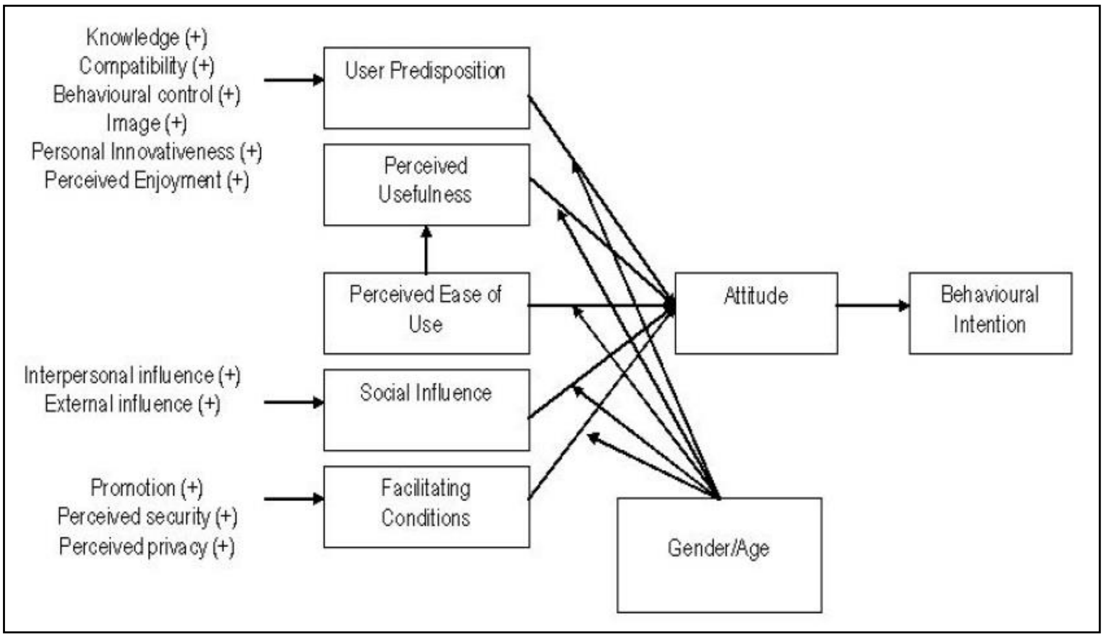
Figure 2-13: Factors affecting the acceptance of ICTs



Source: Alwahaishi and Snášel, 2013

In Rao and Troshani's (2007) model (Figure 2-14), a new construct of User Predisposition was added to UTAUT with factors affecting it including Knowledge, Compatibility, Behaviour Control, Image, Personal Innovativeness and Perceived Enjoyment.

Figure 2-14: Model of Acceptance of Mobile Services



Source: Rao and Troshani, 2007

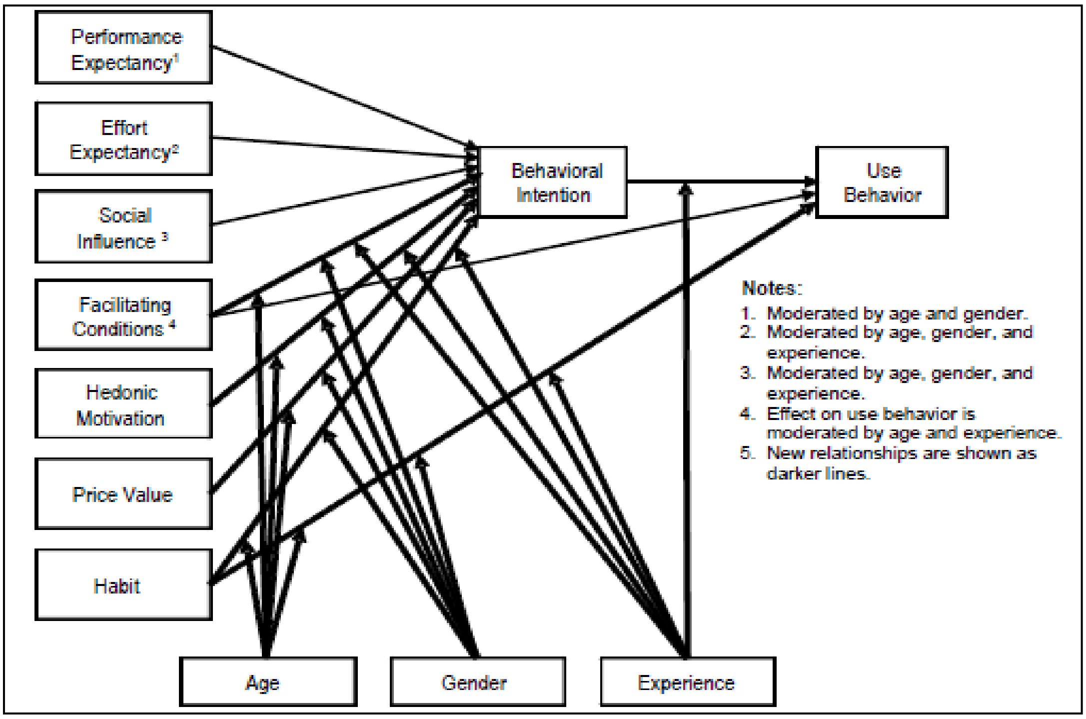
Enjoyment was considered to be one of the factors affecting user predisposition. The authors contended that the more enjoyable the mobile service is, the more likely the individual user will be to continue using it. However, some services like checking emails or the stock market, for example, may not be enjoyable but provide other sorts of benefit and this was evident in an earlier study conducted by Fang et al. (2005). Moreover, the effects of Attitude and Intention were not empirically tested in Rao and Troshani's (2007) model.

UTAUT was mainly built and tested by Venkatesh et al. (2003) for employees in an organisational setting. The implications within the context of this research indicate that the factors age, gender and experience must be considered in order to gain a better understanding of the studied phenomenon. Furthermore, the constructs PE, EE, SI and FC can be applied to understand the factors affecting mobile phone adoption and use in Arab countries, but based on consumers instead of employees. The theory was extended by Venkatesh et al. (2012) to be applicable to the case of individual users (customers). This is discussed in the next section.

2.2.10 The Extended Unified Theory of Acceptance and Use of Technology (UTAUT2)

Venkatesh et al. (2012) extended the original UTAUT further. The original UTAUT, which was created to explain the IT usage of employees in organisational settings, was extended to explain the IT usage of consumers. The original model was altered. The original four constructs of PE, EE, SI and FC in UTAUT (Venkatesh et al., 2003) remained and three new constructs which were found to be applicable and related to the specific case of consumers were added: Hedonic Motivation (HM), Price Value (PV) and Habit (HT) (as shown in Figure 2-15 below).

Figure 2-15: Extended Unified Theory of Acceptance and Use of Technology



Source: Venkatesh et al., 2012

The moderators were only age, gender and experience. Experience moderated the relationship between BI and USE as well as the other hypothesised relationships in the model. However, voluntariness of use was eliminated. This was due to the fact that actual consumers' adoption decision is always voluntary. The main constructs of UTAUT2 were defined as follows;

Performance Expectancy (PE): "the degree to which using a technology will provide benefits to consumers in performing certain activities" (Venkatesh et al., 2012, p.159).

Effort Expectancy (EE): "the degree of ease associated with consumers' use of technology" (Venkatesh et al., 2012, p.159).

Social Influence (SI): "the extent to which consumers perceive that important others (e.g., family and friends) believe they should use a particular technology" (Venkatesh et al., 2012, p.159).

Deutsch and Gerard (1955) categorised social influence into normative social influence, defined as “An influence to conform with the positive expectations of another” (p.629) and informational social influence, defined as “an influence to accept information obtained from another as evidence about reality” (p.629). Informational social influence is applicable to customers’ acceptance of technology systems (including mobile phones). This type of social influence lasts for a long time, as it is based on persuasion. Informational social influence has a significant effect on cognitive response (i.e., PU and PEOU), which proved to be more important for the adoption of technology systems than effective response (emotional attachment to a certain situation). Burnkrant and Cousineau (1975) contended that compliance and identification are related to normative social influence and internalisation is related to informational social influence.

Li (2013) studied the social influence theory developed by Deutsch and Gerard (1955) and stated that “normative social influence has a significant effect on effective response, while informational social influence has a significant effect on cognitive response” (p.272). The author contended that cognitive response is more significant for the case of ICT adoption. However, the main focus of the study was employee adoption of information systems. The case for consumers (especially in different cultures) needs to be investigated further. The decision on adopting new systems can be influenced by information obtained from others (informational social influence) regarding the benefits of using the system and how easy it is to use. Furthermore, it is likely that if the adoption decision is undertaken here, it will last for a long time, as it becomes consistent with the individual’s own value system.

Facilitating Conditions (FC): “consumers’ perceptions of the resources and support available to perform a behaviour” (Venkatesh et al., 2012, p.159). This definition is derived from Brown and Venkatesh (2005) and Venkatesh et al.'s (2003) studies. FC was found to be stronger among older women with a low level of experience. Cost was considered as part of facilitating conditions in previous studies (Brown and Venkatesh, 2005; Rao and Troshani, 2007). The factor FC, in the consumers' case, represents the resources available to consumers. These resources are in the form of educational resources, information available to the individual or help obtained from others to aid an individual's learning on how to use technology and whether this technology is compatible with other technologies the individual is using.

Hedonic Motivation (HM): defined by Venkatesh et al. (2012, p.161) as "the fun or pleasure derived from using a technology, and it has been shown to play an important role in determining technology acceptance and use". This definition is derived from Brown and Venkatesh's (2005) study. HM is also present in the Motivational Model, represented as Intrinsic Motivation and in the MPCU represented as Affect. HM was found to be a more important predictor of BI than PE in UTAUT2. The effect of HM was found to be stronger among younger men with a low level of experience.

Price Value (PV): "consumers' cognitive tradeoff between the perceived benefits of the applications and the monetary cost for using them" (Venkatesh et al., 2012, p.161). This factor refers to consumers' evaluation of the cost of the technology product and its benefits. If the benefits are higher than its costs, PV will be positive (Venkatesh et al., 2012). PV has a strong effect on BI. PV was stronger among older women. When comparing ICT usage and innovation, GDP acts as a powerful indicator (Nour, 2005). The higher the GDP per person is, the lower the chance that cost can become a barrier (Alrawabdeh et al., 2012). However, Kalba's (2008) findings suggested that some low-income countries may still have a high adoption rate. The author contended that GDP should not be considered as a factor that affects technology adoption on its own.

Price is important for the consumers (Mallenius et al., 2007). It has also been found important for the adoption of mobile services, for example m-commerce (mobile transactions) (Alkhunaizan and Love, 2012) as well as mobile phone technology penetration among consumers in the MENA (Middle East and North Africa) countries in particular (Hakim and Neaime, 2014). In fact, price was found to have a more powerful effect on technology adoption than cultural effects for developing countries in an earlier study conducted by Kalba (2008).

Habit (HT): Based on Limayem et al.'s (2007) study, HT was defined by Venkatesh et al. (2012, p.161) as "the extent to which people tend to perform behaviors automatically because of learning". Venkatesh et al. (2012) emphasised the importance of HT as a predictor of both BI and USE. The authors also emphasised the importance of the presence of a stable environment in forming habits in what they referred to as Instant Activation Perspective (IAP). IAP assumes that when individuals repeat performing a behaviour, they establish attitudes and intentions that can be created by the presence of a stable environment. On the other hand, the Habit/Automaticity Perspective (HAP) assumes that when individuals repeat their performance of a behaviour, habit can directly affect their performance. This concept is based on the assumption that when individuals develop habit, they perform it without the need for intentions (i.e., without cognitive processing to establish intentions). Venkatesh et al. (2012) explained that the technological environment and mobile devices have changed over the years, which can make it hard to consider it as a stable environment. This also depends on how sensitive the consumer is towards changes in the environment surrounding them. Venkatesh et al. (2012) found that HT affects both BI and USE such that its effect was stronger among older men with a high level of experience. Limayem et al. (2007) emphasised that within a stable environment, the individual's developed habit is directly related to use. However, when this environment becomes unstable, BI becomes an important factor which comes into play as individuals need to cognitively think of their activities. Venkatesh et al. (2012) included the two main theoretical perspectives of the stored intention view and the habit/automaticity view. While the automaticity view emphasises that changes in the environment can stop automatic cue-behaviour, changes in beliefs that have led to stored intention have a higher possibility of changing habits (Venkatesh et al., 2012). The effect of HT on both BI and USE was higher among older men with a high level of experience in using technology.

The model was tested using mobile Internet technology in Hong Kong, where mobile penetration is over 100%. An online survey was carried out over two stages. The initial stage took place when users participated in the survey for the first time. The second stage took place four months later to understand how the participants were using their mobile phones in order to test habit and experience. The total sample with completed questionnaires was 1,512 participants. While the original UTAUT (Venkatesh et al., 2003) explained 56% of the variance in BI and 40% of the variance in USE, UTAUT2 was able to explain 74% in BI and 52% in USE, which is considerably higher.

UTAUT and its extension UTAUT2 have been tested in some Arab countries with different technology systems, for example Internet banking and mobile banking in Jordan (Abu-Shanab and Pearson, 2007; Abu-Shanab and Pearson, 2009; Abu-Shanab et al., 2010; Al Mashaqba and Nassar, 2012; Al-Qeisi et al., 2014; Alalwan et al., 2014), different systems in Saudi Arabia including desktop computer applications (Al-Gahtani et al., 2007), mobile commerce (Alkhunaizan and Love 2012), mobile learning (Nassuora, 2012), mobile exchange (Al Otaibi, 2013), e-government (Alshehri et al., 2013), Internet banking (Albugami and Bellaaj, 2014), mobile government (Baabdullah et al., 2015), mobile learning (Badwelan et al., 2016), different systems in Egypt including online social media (Salim, 2012) and e-commerce (Al-sahouly, 2015), different systems in Iraq including e-services (Al Imarah et al. 2013), e-government (Faeeq et al., 2015) and mobile learning in higher education (Jawad and Hassan, 2015), different systems in Qatar including e-government (Al-Shafi and Weerakkody, 2009; Al-Shafi and Weerakkody, 2010) and e-learning systems in Lebanon (Masa'deh et al. 2016). The table in Appendix A shows the context, methods and findings of each of these studies.

The findings of these studies were somehow inconsistent with regard to the significance of the factors of UTAUT and UTAUT2 and their extensions. This is consistent with the findings of Williams et al. (2015), where the authors found no existing studies that have fully supported all relationships in the UTAUT model. As UTAUT2 is still new, it has not been examined enough in Arab countries. Significantly fewer studies have examined UTAUT2 than have examined the original version of this theory. Furthermore, none of these studies considered the level of ICT infrastructure and cultural factors related to Arabs, although they are different in Arab countries from the more developed countries where UTAUT and UTAUT2 were developed and tested. In addition, many of these studies used students, employees or knowledge workers to test the model. The inclusion of a sample of students may not be sufficiently representative of the real world (Dwivedi et al., 2008). The use of students was found to be a limitation of many studies testing UTAUT, as found in the meta-analysis conducted by Williams et al. (2015).

All of the studies in Appendix A adopted a quantitative approach (using questionnaires), which is consistent with the methodology of Venkatesh et al. (2003) and Venkatesh et al. (2012). They all tested the model using a single technology and were cross-sectional. In terms of their analysis of the data, only four studies used Partial Least Squares-Structural Equation Modelling (PLS-SEM) to analyse their data, despite the fact that PLS-SEM was used in the original UTAUT and UTAUT2.

Venkatesh et al. (2012) recommended testing their model in different countries, as their findings may not be applicable to countries that are less technologically advanced. The authors also recommended using different age groups and different technologies and identifying other relevant factors that can help to increase the applicability of UTAUT to different consumers of technology products.

Only a few studies have been cross-cultural and tested the UTAUT or its extended version UTAUT2 in more than one country. Al-Qeisi (2009) tested UTAUT (Venkatesh et al., 2003) in Jordan and the UK and Tarhini et al. (2015) compared the use of educational RSS feeds between students in Lebanon and the UK. In both studies, differences in terms of the significance of the factors in the models were found between the countries that were compared, due to cultural differences. In Al-Qeisi's (2009) study, the construct Website-Quality perceptions was significant in both countries and was the most significant factor, followed by PE. SI was insignificant in both countries. PE also acted as a moderator in the model. Gender did not have any moderating effects in the model in either of the two countries while education and income were significant in the UK. The author acknowledged the differences between the models in the two countries. The UK's model had higher explanatory power. Al-Qeisi et al. (2015) assessed the adoption of Internet banking in three Arab countries, Saudi Arabia, Jordan and Egypt, by testing UTAUT. Data from all three countries were put together as a single set for the analysis. Internet banking users from the three countries completed 776 questionnaires. The data were analysed using Structural Equation Modelling (SEM). After analysing all of the data together, Multiple Group

Analysis was used to identify the differences between the three countries. The results of their research showed that FC and SI did not have any significant effects on BI. EE and PE were significant. EE was the most significant predictor of BI in the model. PE was insignificant in the model in Egypt. None of the moderators age, gender or experience were significant. Nevertheless, small differences were found between the groups. However, the data collected from all three countries in Al-Qeisi et al.'s (2015) study were analysed as a single set then Multi-Group Analysis (MGA) for the final structural model as the baseline model was used rather than testing the data separately from each country and comparing the results for an accurate assessment of the similarities and differences between them in terms of the factors affecting BI and USE.

The differences between Arab countries cannot be ignored as they have different economic, political, social, cultural and technological environments. In addition, the sample from Saudi Arabia was found out of range on most of the fit statistics during the MGA. UTAUT did not include 'cultural backgrounds', which is an important factor in the case of users in Arab countries. Dwivedi et al. (2015) conducted a cross-cultural study testing the adoption of mobile health (m-health) using some of the factors in UTAUT2 in the USA, Canada and Bangladesh, and compared the results in the three countries. The authors used Confirmatory Factor Analysis (CFA). The main constructs included in their model were EE, PE, FC, PV, SI, HM, BI, Self-Concept and Waiting Time. HT was dropped from their model since the model was not built based on the assessment of past behaviour. The results showed that many of the constructs were significant in all three countries, although at different levels, except Self-Concept and HM where differences were found. Although a broad stream of research on Internet adoption within the context of the Arab countries exists (for example; Loch et al., 2003; Emdad et al., 2009; Alshaer and Salem, 2013), there is insufficient research on mobile phone adoption in these countries (Baabdullah et al., 2013). Although these studies were cross-cultural, there is a lack of studies conducted within an Arabian context; more specifically, studies that extend UTAUT2 to be more applicable to young Arabs' adoption and use of the new generation of mobile phones (smartphones) and test the new model in more than one Arab country separately to analyse the similarities and differences between them.

2.2.11 Criticism of Technology Acceptance Theories

Ghazizadeh (2012) contended that the existing theories and models related to technology adoption are not conclusive and other factors which have not been considered in any of them need to be included. Similar assumptions were made in an earlier study conducted by Rao and Troshani (2007) on the case of mobile services. The authors stated that studying the adoption of different mobile services may require different adoption models (Rao and Troshani, 2007). Therefore, an investigation of other factors specifically critical for mobile (devices and services) adoption in the Arab countries is crucial. The table in Appendix B provides a summary of the main technology acceptance theories included in this research and identifies the main constructs found in these theories and their applicability to this research.

In line with previous studies (e.g., Szajna, 1996; Agarwal and Prasad, 1997; Lucas and Spitler, 1999), which found that TAM should be extended, Legris et al. (2003) recommended that TAM should be extended to include more constructs in order to be able to explain technology acceptance further. Self-reporting was a major limitation of the TAM model (Chuttur, 2009) and the majority of studies involved the analysis and testing of TAM (Legris et al., 2003). Using this method of data collection can be considered unreliable (Chuttur, 2009). Legris et al. (2003) further criticised the existing studies on the TAM model due to their use of students in their samples, which may not be representative. Chuttur (2009) also contended that there had been a debate in the existing body of literature regarding the constructs of TAM and their importance and relation to each other. The theoretical foundation which forms the basis of the TAM model cannot be used to clarify and predict users' future behaviour. Bagozzi (2007) criticised the main models used to explain technology adoption including TAM, stating:

"The problems with TAM are not entirely peculiar to it, but inhere as well in the TRA and the TPB, which should bring pause to accepting any proposal suggesting that the TRA and TPB constitute panaceas for the field. For purposes of organization, I maintain that the primary shortcomings of TAM (and the TRA and TPB) reside in (1) two critical gaps in the framework, (2) the absence of a sound theory and method for identifying the determinants of PU and PEU, as well as other bases for decision making, (3) the neglect of group, social and cultural aspects of decision making, (4) the reliance on naive and over-simplified notions of affect or emotions, and finally (5) the over-dependence on a purely deterministic framework without consideration for self-regulation processes." (Bagozzi, 2007, p.245).

In fact, Bagozzi (2007) further discussed the limitations of the extensions of TAM such as UTAUT (Venkatesh et al., 2003), claiming that the high number of independent variables makes the measuring process complicated and still not completely sufficient to understand the full picture of technology adoption.

Based on the analysis of the existing technology acceptance theories conducted in this chapter, it can be argued that the majority of the them assumed a high level of ICT infrastructure and availability of technology products. The reason behind this could be that they were created and tested in the developed world where the level of ICT infrastructure is high and technology products are widely available. This does not apply to developing countries, more specifically Arab countries. Furthermore, although these theories acknowledge the importance of social factors in ICT acceptance, factors related to culture and its effect on technology acceptance and use are not well considered in them. It can be argued that the factors related to culture, the level of ICT development and the efficiency of ICT regulations are important for the individual's use in less developed countries where the culture and ICT infrastructure are different. These factors must be considered when studying mobile phone adoption and use in Arab countries.

Venkatesh et al. (2003) stated that UTAUT can be adjusted according to the technology in use. Within the context of this research, this is mobile phone adoption. Wu et al. (2007) claimed that UTAUT (Venkatesh et al., 2003) is subject to adjustment for different geographical areas (such as the case of the Arab countries) and industry type. Baabdullah et al. (2013) carried out an extensive review of the existing body of literature related to consumers' ICT adoption in Saudi Arabia, analysing mobile phone technology and m-government adoption. The authors found that UTAUT2 can very well be applied to studying technology adoption in the Middle East (more precisely Saudi Arabia). However, the authors suggested that the model could be modified and extended by adding new constructs applicable to the context of Arab consumers' adoption. Building on Legris et al.'s (2003) findings, it can be argued that UTAUT in the case of employees and UTAUT2 in the case of individual consumer have an extended ability to explain technology adoption as they both incorporate social factors related to human studies. UTAUT2 can be applied to the case of Arab users' adoption of various technology products. The theory is based on unifying the most significant and related factors in previous technology acceptance theories and has been tested and validated in the case of employees in an organisational setting and individual customers. The research was carried out in Hong Kong, where factors such as infrastructure, culture, economic growth and Internet penetration are different. Therefore, the constructs can be re-tested for the case of the Arab users. The model was tested using mobile Internet. The model can be applied to the current research to understand the variations and effects of age, gender and experience. However, further modification and additional constructs need to be carefully considered in order for the model to fit within the context of technology (mobile phone) adoption in Arab countries.

2.3 Conclusion

This chapter formed the first part of the literature review and the initial stage of the study. It helped to inform the researcher to proceed to the next stages of the research as it formed the basis of the study. This chapter helped to understand the strengths and weaknesses of the main existing technology acceptance theories and the similarities and differences between them. The findings and conclusions of the analysis of the main existing technology acceptance theories indicate that mobile phone adoption cannot be explained using a single theory or model but by integrating and layering different theories and taking into account the specific case and issues related to the adoption and use of mobile phones by young Arab users to gain an in-depth understanding of mobile phone adoption and use in these countries.

The findings in this chapter also indicated that factors related to culture and ICT policies and infrastructure are lacking from the main technology acceptance theories that were analysed. Therefore, the next chapter continues the literature review by providing a more in-depth analysis of mobile phone adoption and use within the Arab region with specific focus on Arab culture and ICT policies and infrastructure. The next chapter provides an understanding of the context of this research and the extension of the conceptual framework. Furthermore, the next chapter provides an in-depth understanding of mobile phone adoption and use in each of the three countries included in the study; Iraq, Jordan and UAE, with specific focus on culture and national IT development.

The next chapter includes two main parts. The first part gives an extensive analysis of the literature related to mobile phone adoption in the Arab countries. The second part provides an extensive analysis of the three studied countries in relation to mobile phone adoption and use.

Chapter Three : Mobile Phone Adoption in Arab Countries

3.1 Introduction

This chapter provides a background to Arab countries in terms of the adoption and use of mobile phones. When analysing technology acceptance, both culture and technological readiness (in terms of technological infrastructure) should be taken into consideration (Göğüş et al., 2012). The first part of this chapter provides a critical analysis of mobile phone technology in Arab countries. The second part provides an in-depth analysis of the situation in each of the three countries included in this study, Iraq, Jordan and UAE, in terms of mobile adoption and use, in particular of smartphones.

The next section provides a background on mobile phone adoption and use within the context of Arab countries.

3.2 Background

There is a lack of data on the telecom industry in the Arab countries in general (Ezzat, 2014). These countries are different in terms of economic, social and political factors (GSMA, 2014). Appendix C shows the number of mobile cellular subscriptions (per 100 people) in Arab countries since 2009. However, the number of smartphone connections is lower than this. There has been incredible growth in mobile usage in the Arab region, from 3% in 2000 to 105% in some parts in 2012 (GSMA, 2013). The use of mobile phones has increased dramatically, with 406 million connections and 199 million unique subscriptions at the end of 2014 (GSMA, 2015b).

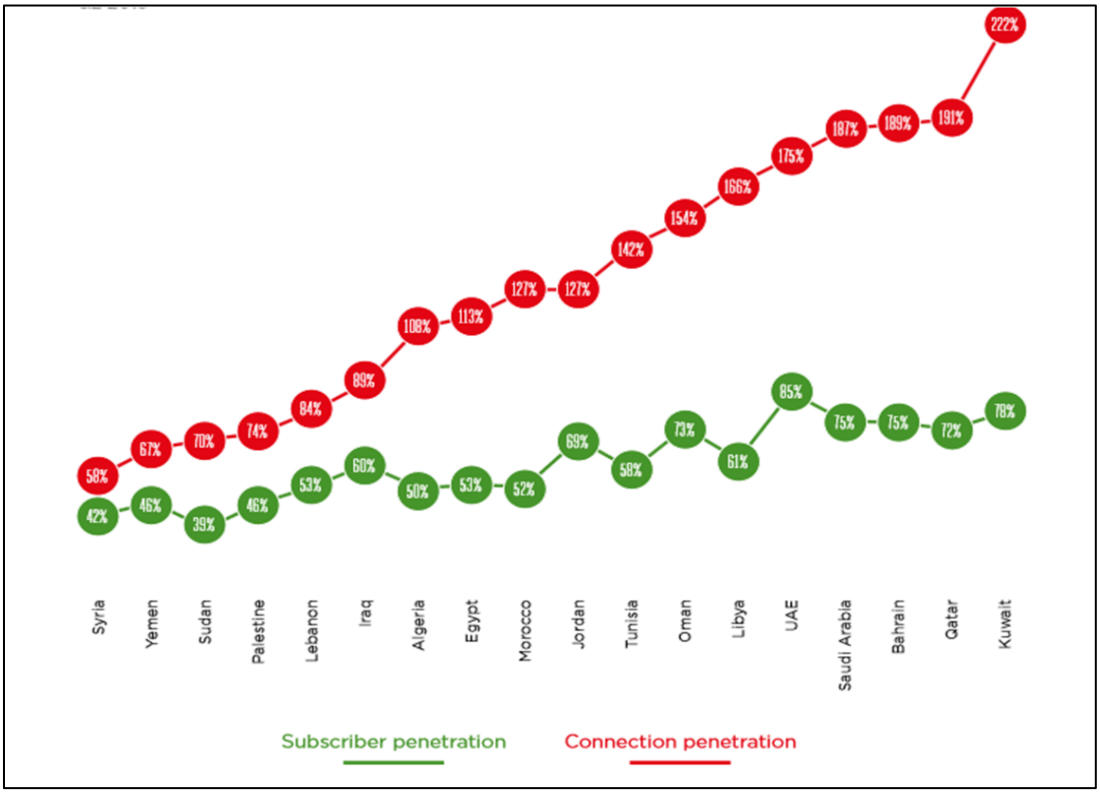
The 2014 Arab Youth Survey results showed that 59% of the surveyed young users in the Arab countries obtain the news online via their smartphones (ASDA'A Burson-Marsteller, 2014). A growing number of them access social media via their smartphones, too. UAE is one of the highest countries globally in terms of smartphones penetration, followed by Saudi Arabia, which is third globally (ASDA'A Burson-Marsteller, 2014). However, obtaining accurate figures for the number of mobile users is problematic and complicated in the Arab countries, as there is a possibility that one mobile phone is used by more than one person in a family in poorer areas. On the other hand, in rich countries like the GCC countries, a high number of mobile users use more than one mobile themselves.

In 2011, 18% of the total mobile devices sold in the Middle East and Africa were smartphones (International Telecommunication Union, 2013). Mobile web and browsing has increased in the Arab countries. In 2013, smartphone users constituted a fifth of the Arab population and a third in the GCC countries. This is expected to increase to 65% by 2020 (GSMA, 2014; GSMA, 2015b). 60% of smartphone users access the Internet via their smartphones (GSMA, 2013). Therefore, using smartphones and writing content in Arabic is important (GSMA, 2013). The Connect Arab Summit follow-up report (2012) addressed these issues, for example, focusing on Arabic content, improving network infrastructure and implementing new policies to improve the use of ICT within the region (Connect Arab Summit follow-up, 2012). However, this has not been explored from young customers' perspective for the use of mobile phones in particular.

The 2014 Arab Youth Survey results indicated that technology can change the behaviours and attitudes of young Arabs (ASDA'A Burson-Marsteller, 2014). Although the opinions of parents, family, friends and religion are important, the effect of social influence is decreasing compared to previous years as the new technologies including smartphones helped Arab users to adopt new modern values (ASDA'A Burson-Marsteller, 2014). Although mobile usage has some disadvantages, such as causing health problems (Attalla, 2011) or ethical issues due to users misusing their mobile phones, for example using them as cheating tools, to talk to others while driving (Sabry et al., 2011) or to have secret relationships (Hameededdin, 2010), the advantages of using them far exceed these disadvantages.

The topic of technology adoption is complicated. For example; mobile adoption differs between one country and another (GSMA, 2013). Furthermore, it differs according to the different types of product to be adopted and the stages (early/late) of adoption. For example, Kalba (2008) contended that the use of postpaid mobiles is distinctive from the use of prepaid mobiles. Hence, prepaid mobiles, where managing daily finances is an issue so a prepaid mobile provides a better method of cash management, are widely used in developing countries, specifically the Arab countries. Figure 3-1 below shows mobile penetration including subscriber penetration and connection penetration in the Arab countries. The mobile connection penetration was higher than the mobile subscriber penetration in all of these countries in 2015.

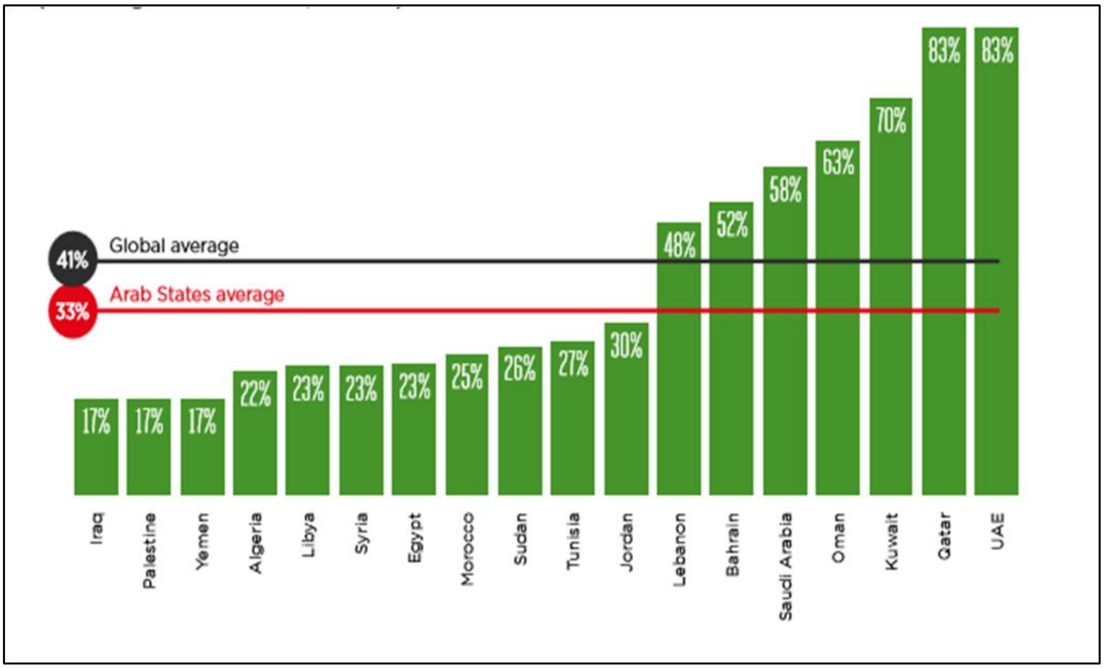
Figure 3-1: Mobile Penetration in the Arab States by Country



Source: GSMA, 2015b, p.8

Figure 3-2 below shows the percentage of smartphone connections of the total mobile phone connections in a number of Arab countries, with some countries having a higher smartphone adoption rate than the global average, namely Lebanon, Bahrain, Saudi Arabia, Oman, Kuwait, Qatar and UAE. It is expected that by 2020, there will be 327 million smartphone connections (65% of the total mobile connections) (GSMA, 2015b). The 2014 GSMA report stated that half of the Arab population is under the age of 25 years (GSMA, 2014). These young people are early adopters of new technologies and this justifies the increase in penetration rate and the further expected penetration (GSMA, 2014), as it is mostly used among young Arabs. Although smartphone penetration is increasing particularly among younger people, the potential and the unlimited opportunities for various sectors in the Arab countries associated with the use of smartphones due to its connection with mobile Internet and mobile applications have not yet been fully explored and realised.

Figure 3-2: Arab States' Smartphone Adoption



Source: GSMA, 2015b, p.12

With smartphone usage increasing in the region, new issues have been raised in association with its successful penetration, such as network coverage and the price of mobile Internet connections as well as mobile applications. These issues cannot be neglected when studying the adoption of this type of mobile phone. There are several potential benefits associated with the use of different mobile applications available through smartphones in Arab countries. For example, m-commerce, m-payment, m-learning or m-health services. This research can be taken as a starting point to work on these areas.

3.3 Mobile Phone Adoption Within the Context of Arab Culture

Hofstede (2001, p.9) described culture as "the collective programming of the mind that distinguishes the members of one group or category of people from another". Previous studies have shown that when studying technology adoption, different factors can be found when taking cultural differences into consideration (Gefen and Straub, 1997; Linjun et al., 2003). Applying models on technology adoption that were originally developed in western countries in non-western countries and different cultures should be carried out carefully (Straub et al., 1997; McCoy et al., 2007). In addition, previous research has shown that there are significant cultural differences between Arab and non-Arab countries (Rose and Straub, 1998). Other studies based on ICT adoption in Arab countries (Rose and Straub, 1998; Loch et al., 2003; Rouibah and Hamdy, 2009), although not specifically investigating mobile phone adoption, have emphasised the significance of culture in the adoption of ICT. The Arab culture can be both a hindering and a supporting factor in technological adoption (Straub et al., 2001; Loch et al., 2003; Emdad et al., 2009). Rose and Straub (1998) recommended that such a complicated culture needs to be taken into account when attempting to understand ICT adoption in this region. The effect of cultural factors was clearly evident during the initial stages of introducing the Internet and Internet content to consumers in Saudi Arabia in 1999 (Al-kinani, 2011). Rouibah and Hamdy (2009) contended that ICT systems must be compatible with Arab culture in order to be accepted.

Hofstede (2001) identified five dimensions of culture:[4] Power Distance, Uncertainty Avoidance, Individualism vs. Collectivism, Masculinity vs. femininity and Long-Term Orientation Vs Short Term Orientation. Hofstede et al. (2010) further extended the cultural dimensions to include Indulgence vs. Restraint.[5]

According to Hofstede (2001), Arabs are high in power distance, high in uncertainty avoidance and moderate in masculinity/femininity. Furthermore, Arab culture is based on collectivism rather than individualism. Within these attributes of Arab culture, the effect of SI is expected to become even more dominant. Hofstede's values have been widely used in Information Systems and technology adoption research (Hoehle et al., 2014). Within the context of this research, it is essential to understand whether the general view of Arab culture applies to all Arab countries. In addition, the researcher must determine whether there are major differences between Arab countries in terms of culture. Arab culture as a whole is considered as a widely holistic view, as the national culture between one Arab country and another may very well be different

[4] **Power Distance** represents inequality between people in a society where the less powerful people accept the fact that power is not distributed equally between all members of society (Hofstede, 2001). **Uncertainity Avoidance** is "The extent to which the members of a culture feel threatened by uncertain or unknown situations" (Hofstede, 2001, p.161). Some people tend to avoid certain situations. On **Individualisim vs Collectivism**, Hofstede (2001, p.225) explained: "Individualisim stands for a society in which the ties between individuals are loose: Everyone is expected to look after him/herself and her/his immediate family only. Collectivism stands for a society in which people from birth onwards are integrated into strong, cohesive in-groups, which throughout people's lifetime continue to protect them in exchange for unquestioning loyalty". In collectivistic societies, people tend to value the opinions of others, including family members and friends and the effect of social influence becomes more apparent. On **Masculinity vs Femininity**, Hofstede (2001, p.297) referred to this dimension as "Masculinity stands for a society in which social gender roles are clearly distinct: Men are supposed to be assertive, tough, and focused on material success; women are supposed to be more modest, tender, and concerned with the quality of life. Femininity stands for a society in which social gender roles overlap: Both men and women are supposed to be modest, tender, and concerned with the quality of life". When a society is described as masculine, people in that society lean more towards achievements and rewards for success. **Long Term Orientation vs Short Term Orientation** was defined as: "Long Term Orientation stands for the fostering of virtues oriented towards future rewards, in particular, perseverance and thrift. Its opposite pole, Short Term Orientation, stands for the fostering of virtues related to the past and present, in particular, respect for tradition, preservation of 'face' and fulfilling social obligations" (Hofstede, 2001, p.359).

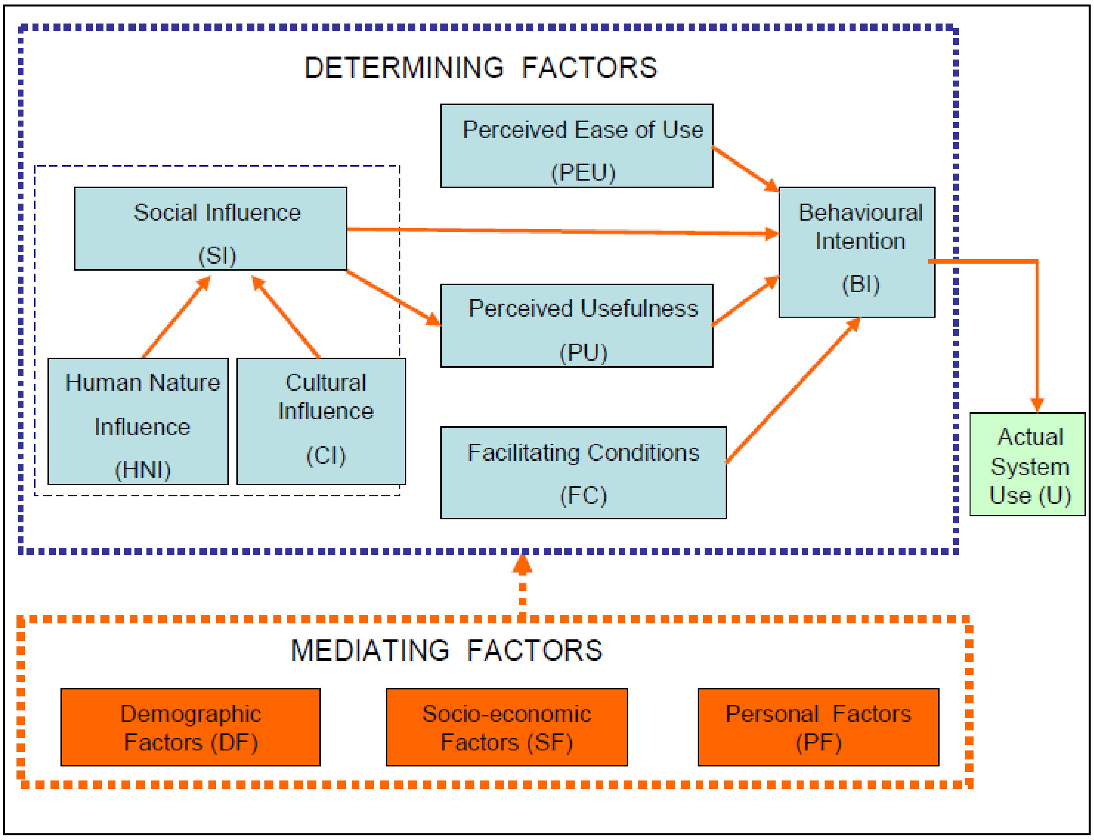
[5] This dimension can be related to the construct of enjoyment in mobile adoption and the extent to which norms can restrict it.

(Straub et al., 2001). Arab countries scored 80 and ranked 7th in power distance, scored 68 and ranked 27th in uncertainty avoidance, scored 38 and ranked 26th-27th in individualism/collectivism, scored 53 and ranked 23rd in masculinity/femininity and no score was provided for long/short term orientation in Hofstede's research (Hofstede, 2001). The author included seven countries in the study "Egypt, Iraq, Kuwait, Lebanon, Libya, Saudi Arabia, and the United Arab Emirates" (Hofstede, 2001, p.52). Although these countries were put together as having one culture (the Arab culture), the author stated that some differences existed (for example in Egypt and Lebanon) but the author had to put them together as 'Arab countries' due to the lack of data about each single country (Hofstede, 2001). However, the author generalised his findings to all Arab countries. Arabic is the main language spoken in the Arab countries. In their literature review concerning Arab culture, Obeidat et al. (2012) found that there is a debate in the existing body of literature as to whether the concept of Arab culture can be generalised to include all countries. On the one hand, some researchers have argued that it is not possible to generalise and imply that Arab cultural values are applicable to all Arab countries (for example; Lamb, 1987; Ali and Wahabi, 1995; Sidani and Gardner, 2000). On the other hand, other researchers have emphasised that Arab countries share similar values which apply to all of them in general (for example Wilson, 1996; Dedoussis, 2004).

Kabasakal and Bodur (2002) stated that some similarities exist in the culture of these countries (in their study, the countries included were Egypt, Kuwait, Morocco, Turkey and Qatar). Feghali (1997) stated that it is incorrect to imply that all Arab countries have the same culture. An example provided was the differences in culture between Saudi Arabia and Lebanon in terms of attitude, behaviour and lifestyle. However, it can be argued that some important values are shared among them. The data available on the Hofstede Centre for National and Organisation Culture's website (Geert-Hofstede.com, 2014) indicated that differences exist between Arab countries in terms of Hofstede's dimensions.

Factors related to culture were added to form a new MOPTAM model (Mobile Phone Technology Adoption Model) by Van Biljon and Kotze (2008) based on the modification of their original model created in 2007 (Van Biljon and Kotze, 2007) to provide a more in-depth view (as shown in Figure 3-3 below). Although the model was not designed specifically for mobile adoption within the context of Arab countries, it is helpful in understanding the role of culture in mobile phone adoption. Therefore, it has been included in this section. The authors stated that mobile phone adoption is different from one person to another. Thus, Human Nature Influence can affect Social Influence as well as Cultural Influence. The authors contended that culture has specific dimensions in the case of mobile phone adoption, probably different from adopting other technologies: demographic, social, cultural and contextual factors can affect mobile phone users (Van Biljon and Kotze, 2008). The authors found that SI can directly affect PU and BI. This is consistent with the findings of an earlier study carried out by Karahanna and Straub (1999), who contended that PU stems from SI and social presence in the case of communication technologies. The authors contended that social presence is strictly related to communication technologies. Within Van Biljon and Kotze's (2008) research, SI was taken from a generic view. A more focused view of SI as a result of Cultural Influence would help to confirm the role of culture even further. Stemming from UTAUT, the authors found that FC has a significant influence on BI in the case of mobile phone adoption.

Figure 3-3: Mobile Technology Adoption Model (MOPTAM)



Source: Van Biljon and Kotze, 2008

The model has similar features to UTAUT (Venkatesh et al., 2003). However, UTAUT treats age, gender, experience and voluntariness as moderating factors that can affect the relationships between the independent factors and dependent factors in the model. Although the mediating factors (summarised in Table 3-1) proposed by Van Biljon and Kotze's (2008) model, personal, demographic and socioeconomic factors, are able to summarise the main issues that can influence the individual's use of mobile technology, they can be seen as being too broad. However, they are applicable to the case of Arab users within the context of Arab culture and need to be considered when studying mobile phone adoption in these countries.

Table 3-1: Mediating Factors in Van Biljon and Kotze's Model

Mediating factor	**Components**
Personal factors	Relative advantage Compatibility Complexity Trialability Observability Image Trust
Demographic factors	Age Gender Education Technological development
Socioeconomic factors	Job status Occupation Income

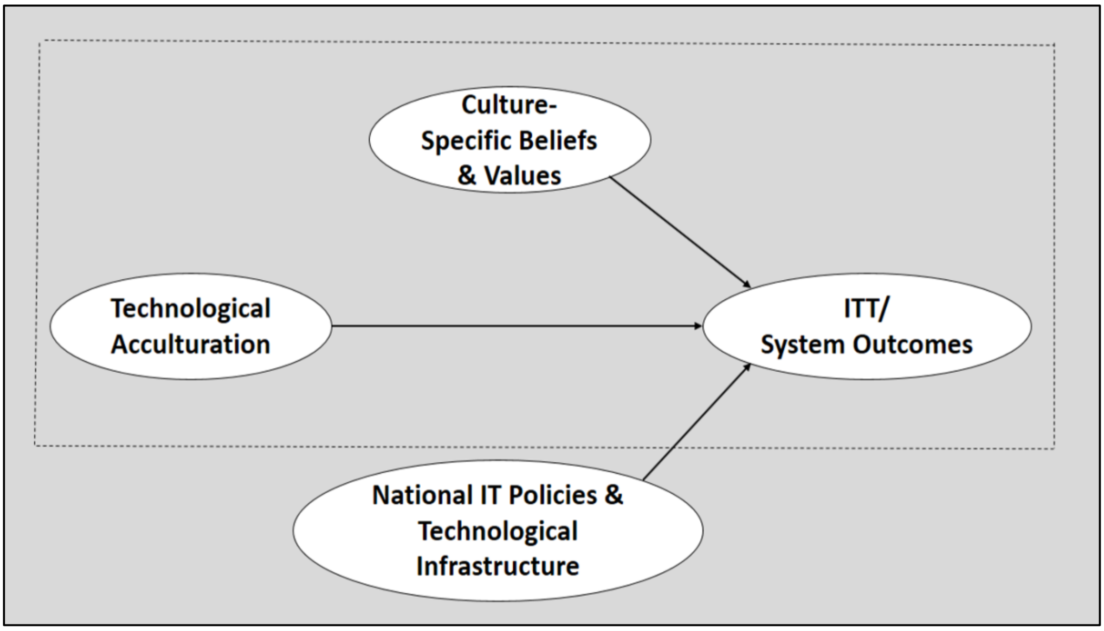
Source: Van Biljon and Kotze, 2008

Ibahrine (2009) explained that using mobile phones has indeed caused both positive and negative changes within the social culture in Arab countries. On one hand, the use of mobile phones has helped families to connect informally on regular basis and SMS (Short Messaging Service) is widely used in Muslims' celebrations (Srivastava, 2005; Ibahrine, 2009). On the other hand, some of the additional mobile services integrated within the mobile device, such as the mobile camera, that have been misused have been thought of as a threat to the privacy of other people, especially females, in the GCC countries, specifically in Saudi Arabia (Ibahrine, 2009). Mobile phones can be used for texting and exchanging images and videos between males and females, who according to the culture of some Arab countries, in particular the GCC countries, should be separated (Ibahrine, 2009). As in the case of users in Saudi Arabia, users in

Egypt think that mobiles infringe people's privacy through the use of cameras (Kamel and Farid, 2007). Although new laws have been introduced to ban such activities in some of these countries, for example Saudi Arabia (Srivastava, 2005; Murugaboopathi et al., 2013), these incidents are still occurring. This forms a threat to the structure of the Arab culture. The use of mobile phones in certain situations forms a threat to the protection of the culture and Islamic religion. On the other hand, Ibahrine (2009) anticipated that mobile phone usage can extend to change the political situations in these countries. This was evident in the Arab Spring in many countries, including Egypt, Libya, Yemen, Syria, Bahrain, and other Arab nations where mobile phones played a critical role in gathering people and organising demonstrations and protests (Allagui and Kuebler, 2011; UNDP, 2013) through mobile social media including Facebook and Twitter. The most important characteristic of mobile phones, their mobility, helps to protect people from different age groups, especially in countries which are considered less safe than others (for example Iraq).

Straub et al. (2001) developed the Cultural Influence Model for Information Technology Transfer (Figure 3-4). The authors found that both Technological Culturation (TC) and Culture-Specific Beliefs and Values (CSBV) (time for planning) have significant effects on system outcomes. A national IT policies and technological infrastructure construct was also included but not tested. This construct was defined as, "specific technology policies that guide the development of information systems in a specific country together with the existing structure of computing and communication capabilities and the ability of the population to operate and utilize these capabilities. The overall construct reflects the level of support for technological development within a given nation" (Straub et al., 2001, p.9). Although this construct was not tested in their study, it may very well apply to the case of Arabs' use of mobile phones. Without an efficient ICT infrastructure and policies in place, Arab individuals will not be able to adopt and exploit the full potential of using mobile phones. This is especially the case for the latest generation of mobile phones, smartphones, which require an effective ICT infrastructure for mobile Internet and mobile services in place.

Figure 3-4: Cultural Influence Model of Information Technology Transfer

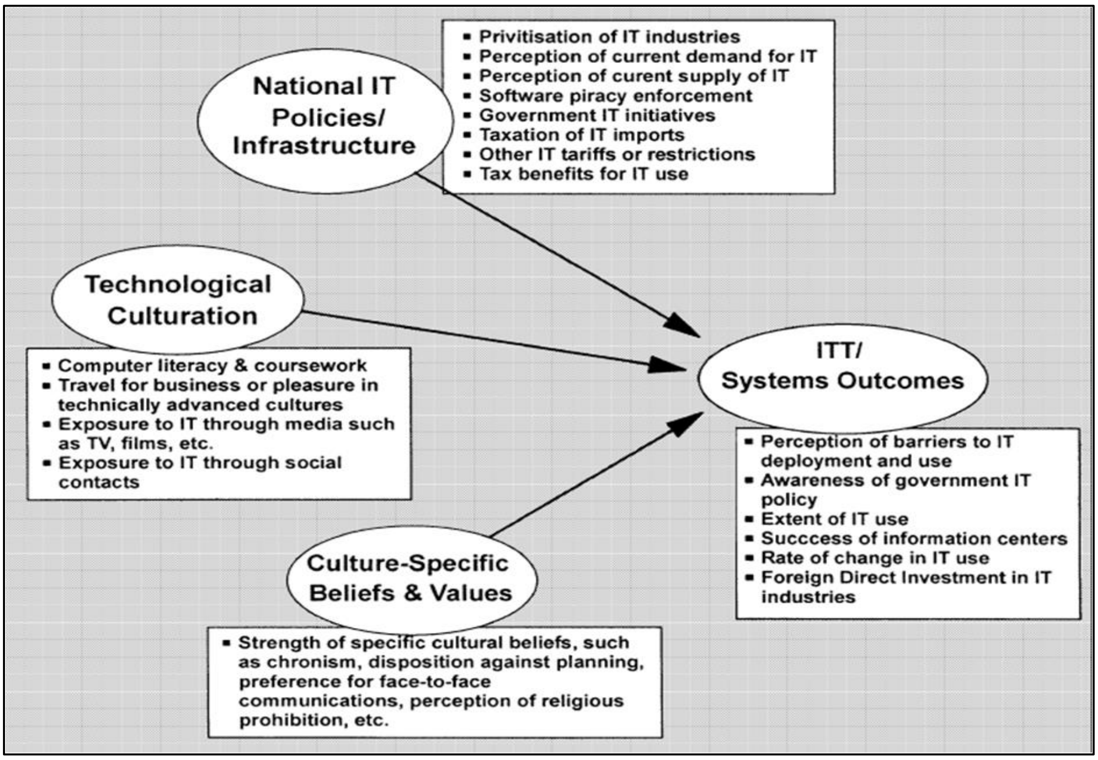


Source: Straub et al., 2001

Although Straub et al.'s (2001) study was based on the perceptions of employees in organisations, the social and cultural factors that were considered in this study may very well apply to the individual user, too. Technological culturation (TC), defined as "Influential experiences that individuals have had with technologically advanced cultures" (Straub et al., 2001, p.9), was found to be significant in Straub et al.'s (2001) model. In fact, the authors found that both TC and CSBV (more specifically time for planning) had a significant effect on system outcomes/ITT (Information Technology Transfer). Straub et al. (2001, p.9) defined Culture-Specific Beliefs and Values (CSBV) in their model as "those specific beliefs, values and meanings that are thought to have a downstream effect on the use of information systems". However, culture-specific beliefs (time for planning) may not apply to mobile adoption, as there is no time required for planning by the individual user. The CSBV construct in Straub et al. (2001) was substituted by social norms in a later study conducted by Loch et al. (2003) (in which two models for Internet acceptance among Arabs were developed, one model for organisational Internet acceptance and another for individual Internet acceptance) as a factor that represents culture in a more general view (Figure 3-5). On the other hand, face-to-face versus technology-mediated meetings are more related to mobile phone adoption and use. Direct and face-to-face meetings are a priority in Arab culture (Rose and Straub, 1998).

Culture-Specific Beliefs and Values are considered to be boundaries that hinder ICT acceptance (Straub et al., 2001; Loch et al., 2003). Loch et al. (2003) analysed cultural influence modelling and IT transfer based on Hill et al. (1994) and Straub et al.'s (2001) studies to analyse their effects on system outcomes. The main measurements for the National IT Policies/Infrastructure construct in the model developed in Cultural Influence Modelling and IT transfer in Loch et al.'s (2003) study were privatisation of IT industries, perception of current demand for IT, perception of current supply of IT, software piracy enforcement, government IT initiatives, taxation of IT imports, other IT tariffs or restrictions and tax benefits for IT use. Although this model was not tested using mobile phone technology, it is closely related to the influence of the Arab culture on technology adoption and usage which can be applied to mobile phone adoption and usage.

Figure 3-5: Cultural Influence Modelling and IT Transfer Based on Straub et al. (2001) and Hill et al. (1994)



Source: Loch et al., 2003

Loch et al.’s (2003) study was the only one to test and analyse technology adoption from the perspective of both organisational and individual Internet acceptance. The approach undertaken to increase technology adoption for both types of users is distinguishable. The construct National IT Development was included but not tested in the studies conducted by Straub et al. (2001) and Loch et al. (2003). Within the characteristics of Arab culture, social norms become even more important (Loch et al., 2003). Loch et al. (2003) stated that national culture affects technology adoption via social norms which become stronger in the Arab culture due to its nature. Furthermore, the authors contended that Technological Culturation (TC), defined as “The cultural exposure and the experiences that individuals have with technology originally developed in other countries” (Loch et al., 2003, p.46) is important. However, finding new ways to increase technological culturation and implementing them can be a challenge in some of these countries due to the lack of resources. The findings of Loch et al.'s (2003) study indicated that there is a possibility that social norms are sufficient to represent the effect of culture on technology adoption. The authors contended that social norms and technological culturation apply to the adoption of other technologies as well as the adoption of the Internet. Although Loch et al. (2003) did not find TC statistically significant in their individual model and recommended that future studies should redesign the scale used for TC within a carefully developed theory, they found clear evidence that this construct is important for Arabs' use of technology.

In both Straub et al. (2001) and Loch et al.'s (2003) studies, Technological Culturation: Informal Technological Culturation was measured through four items. Some items were measured using a degree scale and others using a five-point Likert scale. Experiencing new and developed technologies in other countries with different cultures can affect technology adoption positively. An alternative solution is probably for the telecom markets in Arab countries to be open to foreign telecom companies to invest in them, which can, in turn, provide people in these countries with the opportunity to experience new advanced technologies in a new and less costly way. Al-Mabrouk and Soar (2009) suggested an applicable solution which can be used to address this issue. The authors proposed developing high-level R&D (Research and Development) centres in Arab countries. The role of the R&D centres may very well include the adaptation and modification of certain functions of standardised ICT systems developed in other countries to be used successfully within the local Arab country's circumstances and culture (Al-Mabrouk and Soar, 2009).

Although previous research has shown that Arab countries must be distinguished in terms of culture, Boudreau et al. (2001) and Hoehle et al. (2014) stated that culture cannot be thought of as being homogeneous among individuals living in the same country. Hoehle et al. (2014) contended that cultural values, even within one country, can differ between one individual and another. The authors stated that cultural values espoused at the individual user level affect usability (Hoehle et al., 2014). The authors built on an earlier research by studying the effect of Hofstede's dimensions of cultural values espoused at an individual level as moderator variables moderating the effect of six constructs around the usability of mobile social media applications on continued intention to use mobile social media applications (Hoehle et al., 2014). The work of Hoehle et al. (2014) was conducted in four countries, the USA, Germany, China and India, and their work proved that culture, at a country level, does not have a significant moderating effect on continued intention to use mobile social media applications. Straub et al. (2002) recommended measuring culture at the individual level by adopting a positivist approach, using quantitative data (a measurement scale). In addition, the authors contended that it is unlikely to be possible to include all cultural values in a study. Therefore, the authors recommended studying a subset of cultural values at the individual level that are related to the key area of enquiry. Researchers need to decide which subset of cultural values is to be studied in a research based on the technology under investigation, whether it is interactive or non-interactive (El-Louadi and Everard, 2004).

It is important to realise that Hofstede's dimensions are not the only measure of culture that can be taken into consideration when studying IT adoption, as there are other important cultural attributes that are related to Arabs and the specific technology under investigation. Hofstede's dimensions can be used as general indicators of the culture of the specific country in which technology adoption is investigated. Furthermore, the analysis of the literature in this section indicated that although studying cultural differences between individual countries can highlight some important issues, even more important aspects to consider are the culture espoused by each individual user in relation to mobile phone adoption and including one subset of the Arab cultural values instead of all. The next section provides a discussion regarding the ICT infrastructure in the Arab countries in order to fully understand any issues or obstacles facing mobile adoption and usage in these countries.

3.4 Mobile Telecom Development and Policies in Arab Countries

In order to gain an in-depth understanding of mobile phone adoption by Arab users, information is required regarding ICT infrastructure in Arab countries, the state of the telecommunication markets and the level of control of Arab governments over the industry. This section provides a discussion and analysis of these issues. Diab (2010) contended that the case of telecommunication companies in the Middle East is unique compared to companies in any other region in the world for three main reasons: first, the majority of the population is young, second, the Arab culture is unique, third, the high demand in this region leads to higher adoption rates. Smartphone penetration in Saudi Arabia alone exceeded smartphone penetration in the USA (Akhunaizan and Love, 2013). However, there is a lack of recent studies that address the current situation of the telecommunication market in the Arab countries (Ameen and Willis, 2016a).

The GSMA (2014) report showed that although mobile phones are widely used in these countries, there is still a great potential for improving their usage[6] related to different aspects that can improve social and financial aspects of life such as education, health and mobile payments. Understanding Arab users' preferences in terms of mobile phone usage can contribute towards extending their usage to fulfil this potential. The GSMA (2015b) report revealed a decline in revenue for mobile companies in the Arab region. The report revealed that the reasons behind this could be the fact that while the mobile penetration rate is high, mobile adoption growth rate is slowing significantly, as well as the fierce competition between companies operating in the markets and the unstable political and economic conditions in the region. Although it is expected that the revenues level will increase again, the increase is likely to be modest (GSMA, 2015b). There was a decline of 2.4% in revenues obtained by mobile operators in 2014 (GSMA, 2015b). In 2015, 54% of the total population of the Arab states were mobile subscribers. However, as the subscriber growth has reached a high level, it is anticipated that it will slow significantly, leading to just 57% in 2020, below the global average (GSMA, 2015b). The slow growth is also a result of the unstable political and economic conditions in some countries in the region and the increased competition between mobile companies (GSMA, 2015b).

The liberalisation of the telecom market in the MENA countries is still an issue due to government control (Ezzat, 2014). Ezzat (2014) described the situation of the telecom markets in the MENA countries as allowing some level of liberalisation and

[6] According to the GSMA's (2014, p.32) report, there are four main barriers to increasing the availability of mobile Internet services in the region: "Infrastructure and networks: increasing network coverage to currently unserved areas; • Affordability: improving the affordability of mobile internet services; • Consumer barriers: including digital literacy and awareness; • The availability of local content: content that is both local language and locally relevant".

competition and controlling the regulators. In the majority of Arab countries, the government still has either full control or a major share in this sector (Abbasi, 2011) and the sector is mainly controlled by it (GSMA, 2014). In general, the regulatory framework is highly varied in the Arab region (International Telecommunication Union, 2013). Even with the presence of regulatory authorities, the development of ICT laws and policies is carried out by the sector's ministry in these countries, which creates inconsistency (International Telecommunication Union, 2013). Openness and competitiveness in the market are vital for increasing the usage of technology, due to their direct effect on price reduction (Varoudakis and Rossoto, 2004).

Openness to foreign international companies and allowing them to invest in the sector can help in bringing new changes for development and improving the current ICT infrastructure in the region (Abbasi, 2011) which, in turn, can impact positively on mobile phone adoption and usage. The number of competitors in the market, the level of efficiency of the policies originated by the regulatory body, how open the market is for international companies to operate in and the level of the individual's income are used to understand the competitiveness of the market (Varoudakis and Rossoto, 2004). This, in turn, has a direct effect on prices. The international harmonisation of policies and regulations across Arab countries to create a single digital market (keeping in mind cultural differences) that can benefit from economies of scale was recommended in the 2015 GSMA report (GSMA, 2015b).

In 2013, nearly all Arab countries completed or started to launch 3G networks. The GSMA 2015 report revealed that 4G networks are available in ten Arab countries, with eight more networks in Iraq, Jordan, Algeria, Libya and Egypt to be available in the upcoming years (GSMA, 2015b). Saudi Arabia, Qatar, Kuwait and UAE form the strongest mobile markets in the region. The Connect Arab Summit follow-up report

(2012) stated, “In 2011, the mobile industry was responsible for driving a further USD78 billion of revenue for the economies of the Arab states” (Connect Arab Summit follow-up, 2012, p.17). Mobile technologies help to increase economic growth. Furthermore, the effect of 3G penetration on GDP per capita has been significant (Williams et al., 2013). In fact, the relationship between GDP level in a developing country and ICT adoption has been described as a two-way relationship (Abbasi, 2011). The higher the level of GDP in a country, the more people can afford to adopt new technologies, therefore, the higher the level of ICT adoption. On the other hand, the increase in the level of ICT adoption leads to an increase in GDP and economic growth (Virta et al., 2011; GSMA, 2013). The GSMA (2013) report stated that the mobile industry can be the second source of wealth after the oil industry in the Gulf countries (GSMA, 2013). Developing countries rely heavily on prepaid phones (pay as you go) (Kalba, 2008).

In the Arab countries, developing a fully working regulatory framework is seen to be slower than other markets. Market competitiveness is also still behind compared to other markets (Varoudakis and Rossoto, 2004). Hakim and Neaime (2014) contended that liberalisation is based on two steps: first, setting and implementing the right laws and regulations via an independent regulating body. This was also stated by the International Telecommunication Union (2013). Second comes the actual liberalisation process (Hakim and Neaime, 2014). Setting up the right policies remains problematic (Alrawabdeh et al., 2012; UNDP, 2013; International Telecommunication Union, 2013). The process of liberalisation and issuing licensing to more than one company took a long time to start in the Arab countries. The reason behind this is that the governments wanted to keep their investments in the industry to themselves. Diab (2010) stated that the process of liberalisation in the Middle East started mainly as a requirement of the World Trade Organization. The International Telecommunication Union (2013) report stated that liberalisation leads to increased competition. Privatisation on its own does not mean having a proper competition in the market. Ezzat (2014) found that the process of privatisation may not bring any significant changes if the privatised operator is still a monopolist.

Although competition is increasing in mobile markets in the Arab countries, the key areas of telecoms such as international gateways and ‘single wholesale networks’ are still controlled by monopolists (GSMA, 2014). Appendix D shows the regulatory landscape for mobile cellular and mobile broadband services for selected Arab countries. The process of privatisation on its own is insufficient. In order for privatisation to bring effective results, the presence of an independent regulatory body and competition in the market are required (Ezzat, 2014). When the government rules the regulatory body and owns the largest telecom operator, competition cannot exist (Ezzat, 2014) and customers become at a disadvantage. This is the case in the majority of the mobile markets in Arab countries. The three reforms studied by Ezzat (2014) included regulation, privatisation and competition in relation to four dimensions of telecom operators: access, affordability, productivity and quality. Having the three elements (reforms) simultaneously increases mobile penetration (Ezzat, 2014). The increase in competition helps to reduce costs and increase mobile penetration (Diab, 2010). On the other hand, Kalba (2008) contended that the increase of competition to include a high number of competitors “four or five operators or more” (p.64) is not necessarily beneficial in terms of increasing technology adoption. Nevertheless, it can be argued that this can affect it indirectly, as the more competition exists in the mobile markets, the more offers, promotions and reduced prices customers will obtain.

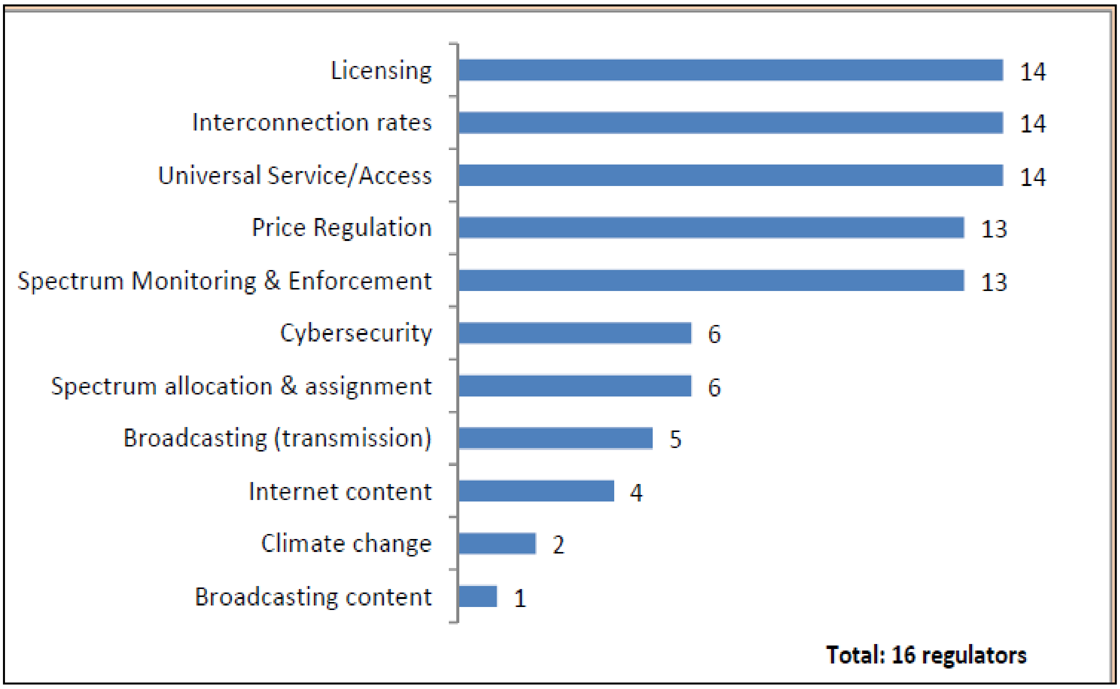
It can be argued that the issue of price reduction becomes even more crucial for the case of developing and poor countries compared to the rest of the world. In particular, in the Arab countries, an example is Egypt, where price was found to be a significant driver of mobile phone adoption and usage (Kamel and Farid, 2007). This was also confirmed in a later study conducted by Abu-Shanab and Abu-Baker (2014), who found that price was an important determinant for selecting a mobile phone to buy in Jordan, especially for young people. Puumalainen et al. (2011) contended that the prices of using ICT technologies are higher in developing countries compared to developed countries. Price may have become even more important for Arab users after the economic crisis and the Arab Spring, as the average income has decreased (Khandelwal and Roitman, 2013). In addition, unemployment levels are high, particularly for the young (Jelili, 2010; Roy et al., 2011). In fact, unemployment and the increasing cost of living were major concerns for young Arabs in 2014 and 2015 (ASDA'A Burson-Marsteller, 2014; ASDA'A Burson-Marsteller, 2015). ICT prices in Arab countries are higher than the world average (Alrawabdeh et al., 2012). However, there has been a decrease in handset (mobile phone and calls per minute) prices across the Arab region. Although it differs from one country to another, the reduction in price has been significant since 2008 (GSMA, 2013; GSMA, 2014). However, further reductions are still required (GSMA, 2014). In fact, price is important even in the GCC countries (International Telecommunication Union, 2013).

Within the context of Arab countries, apart from the GCC countries, the network connectivity strength is low compared to developed countries. This has a direct effect on real-time searching. Users in Saudi Arabia, for example, are able to use real-time information (Alkhunaizan and Love, 2012) due to the strong technological infrastructure in the country. However, users in other Arab countries may not be able to obtain information from their mobile devices as quickly as they require. The policies implemented in the Arab countries need to be flexible and provide more freedom in order to allow easier adoption and access to technologies among different users in these countries (Al-Mabrouk and Soar, 2009). The GSMA (2013) highlighted three main areas where policy changes are required. First, taxation for mobile services in some countries, for example Egypt, Jordan and Morocco, is high. The International Telecommunication Union (2013) report stated that policies related to taxation must be developed in the Arab region. The mobile taxes implemented by Arab governments are higher than the global average, and this is a major barrier in Arab countries (GSMA, 2015b). A restructuring of the taxation system and considering the ICT industry as an industry that has been there long enough and contributes to the economy by increasing GDP is required. Second, the liberalisation of the network in countries such as Iraq and Egypt where the network is owned by the government is required. This is also the case in other countries such as UAE. Third, decreasing the Universal Service Fund (USF) that telecom operators (for example in Algeria and Morocco) have to pay is also required. The report stated that the USF may not have been paid to improve the mobile network infrastructure. It should be clear whether these funds are required; if so, they should be spent on the mobile network infrastructure, as it should be considered as a major industry.

The International Telecommunication Union (2013) report also stated that there is a need to promote private sector investment as well as allowing foreign investments. The encouragement of foreign investment will increase innovation in the sector in different countries and make it open to new, more advanced technologies. This will bring many advantages, for instance increasing competition, which in turn will make companies strive to provide lower prices and constantly increase the quality of their service to maintain and improve their position in the market. So far, the only Arab country that has been highly successful in openness to foreign investment operations is Morocco (International Telecommunication Union, 2013).

Although foreign investment exists in some Arab markets in the region, such as France Telecom investing in Mobinil in Egypt in 1998 and in Jordan Telecom in 2006, and Vodafone in Qatar (International Telecommunication Union, 2013), an increase in foreign investment is still required. Figure 3-6 below shows the mandate of regulators with areas where regulations should be taking place and the priorities of regulators for the Arab region based on sixteen regulators from the Arab countries, found in ITU World Telecommunications/ICT Regulatory report (2013).

Figure 3-6: Mandate of Regulators, Arab States, 2011



Source: ITU World Telecommunications/ICT Regulatory Database, adapted from International Telecommunication Union, 2013, p.37

The Connect Arab Summit (2012) report identified major goals which the region should achieve and have not yet been completely solved. The goals were to solve the issue of spectrum management in the Arab region, cyber security problems and digital content. Spectrum band harmonisation within the Arab region will bring vital benefits across all Arab countries, especially in decreasing prices (GSMA, 2013; Gelvanovska et al., 2014) as it will allow a unified device model to be used for all Arab countries (International Telecommunication Union, 2013). The report predicted that if this is not implemented, the entire region will be severely affected by 2020. The use of different mobile services requires increasing the spectrum (International Telecommunication Union, 2013; GSMA, 2015b). The need for sufficient spectrum became even more apparent in different Arab countries in 2013 and the years that followed (GSMA, 2014; GSMA, 2015b). There is an urgent need for more spectrum, and policymakers in the Arab countries need to address this issue.[7] Moreover, the spectrum licensing fees that need to be paid by the operators are considerably high, along with highly restrictive spectrum licensing policies. This is especially true in the case of Iraq, where the fees are significantly higher than other, richer countries (GSMA, 2014). This issue was also identified in the 2015 GSMA report (GSMA, 2015b).

Based on the above, important points need to be highlighted. First, the benefits of using mobile phones exceed the individual level. They actually extend to a national level, as mobile phones constitute a good economic source for the Arab countries, being the second source of income in some of them, for example Lebanon and other

[7]A high proportion of the spectrum is currently provided to the Arab Gulf countries in comparison to the rest of the region (GSMA, 2013). In 2012, UAE allocated the 700 MHz spectrum to mobile (Connect Arab Summit follow up, 2012). However, this approach was not taken by other Arab countries. The International Telecommunication Union (2013) indicated a need for careful allocation of the spectrum between different technologies using different methods including clearing some bands which are used for outdated services and 'reframing', which is "Relocating existing users to a different band; including compensation and relocation" (International Telecommunication Union, 2013).

Arab Gulf countries. This is possibly the reason for the control of this sector, in particular, by Arab governments rather than privatising it. Second, although the Arab countries are moving towards privatisation, the governments of the majority of these countries are still in control. Third, important regulatory issues related to the mobile market must be addressed in the region. These issues include spectrum allocation, competition, taxation, price regulations, licensing and privatisation and openness to foreign investment. Fourth, price is an important factor for the mobile markets in Arab countries.

This section provided support for the model developed by Straub et al. (2001) and extended by Loch et al. (2003) (discussed in Section 3.3), primarily as the review provided in this section showed clearly that the issues related to national IT infrastructure are closely related to mobile phone adoption in the Arab region. This must be analysed in order to obtain an in-depth view of mobile phone adoption and use by young Arabs. The next section provides an in-depth analysis of each of the countries included in the study in relation to mobile phone adoption and use.

3.5 A More In-depth Look at the Studied Countries

The role of national resources available to the user cannot be neglected (Meso and Muso, 2008). Brach (2010) categorised the types of user in the MENA countries into consumers, integrated users and isolated users. With reference to the three countries studied in this research, Table 3-2 shows the category in which users in each of the three countries are located.

Table 3-2: Technological Competence by Country Group

		Access (recent technologies are generally available)	Adoption (available technologies are applied efficiently)	Development (development of new-to-country technologies)
Country groups	Standard measures and available indicators:	trade openness, WTO membership, number of free trade agreements, average tariff	total factor productivity, international competitiveness, technological readiness, business sophistication	R&D expenditures, patents, number of researchers
Developer	Israel, Iran, Turkey	++	++	++
User	*Consumer:* Bahrain, Qatar, Kuwait, Oman, Saudi Arabia, United Arab Emirates	++	++	-
	Integrated User: Tunisia, Jordan, Egypt, Morocco, Lebanon	++	+/-	+/-
	Isolated User: Algeria, Syria, Palestinian Territories, Yemen, Libya, Iraq	-	+/-	--

Source: Brach, 2010

While consumers in the Arab Gulf countries (i.e., UAE within the context of this research) are open to the latest technologies available globally, 'Consumers', 'Integrated users' (located in Jordan) are significantly less open to them. The third category is the 'Isolated' users who are based in Arab countries that have had severe political situations and wars (i.e., Iraq within the context of this research) over the past decade.

The next subsections provide an in-depth view of each of the studied countries, followed by a comparison between them in terms of national factors related to mobile phone adoption and use.

3.5.1 Iraq

Iraq is the third largest mobile market in the Arab region (GSMA, 2014). The population of Iraq in 2014 was 34.8 m with a GDP-PPP (Purchasing Power Parity) of 494.5 USD billion (ASDA'A Burson-Marsteller, 2015). Iraq is a lower middle-income country in which people generally have a low income (Rohwerder, 2015). The mobile cellular subscription (per 100 people) was 95 in Iraq in 2014 (World Bank, 2016). Smartphone adoption rate in Iraq was 17% in 2015 (GSMA, 2015b). The main mobile operators in Iraq are AsiaCell, Zain and Korek (Kamli, 2012; Connect Arab Summit, 2012; Khayyat and Heshmati, 2013). Both Korek and AsiaCell have introduced special deals and tariffs for the youth segment of their customers, which include Internet services. Iraq is starting to move towards 3G networks. Nevertheless, mobile operators in Iraq have experienced the highest fall in revenues among all Arab countries, as they fell by 12% in 2014 in comparison to 2013 (GSMA, 2015b). The unemployment rate in Iraq increased from 20% in 2014 to 34% in 2015 among young people aged 15-24 years (GSMA, 2015b), which is a high increase. In Iraq, 89% of the population has a mobile connection and 60% are subscribers (GSMA, 2015b). Gender gaps in terms of mobile phone adoption are large in Iraq, as only 20% of the total mobile phone users are female (GSMA, 2014). Gender gaps in terms of women's participation rate in the labour force are the highest in Iraq in comparison to other Arab countries (European Parliaments, 2014). The study conducted by Ameen and Willis (2016b) showed that mobile phones are important for empowering Arab women, including women in Iraq.

Iraq is still behind in terms of mobile adoption and penetration. In fact, compared to the rest of the Arab countries, even in the northern part of Iraq (Kurdistan) which is considered more settled economically and politically, the country is still considered behind in terms of ICT infrastructure (Sanati,2005; GSMA, 2015b). The price of ICT technologies for consumers in Kurdistan was addressed as one of the issues which the Kurdistan government needs to plan a strategy in order to reduce (Sanati, 2005). However, these plans have not been implemented yet. This puts Iraq behind in comparison to the other two countries in terms of mobile network, and this is hindering the fast penetration of mobile Internet in the country.

The Kurdistan region is slightly more advanced in terms of telecommunication compared to the southern part of Iraq, in which the use of mobile phones started later than in other Arab countries (Khayyat and Heshmati, 2012). There is an absence of regulations related to telecommunication as well as the absence of an efficient regulatory authority (Tawfeeq et al., 2014). In addition, telecommunication companies in Kurdistan are protective in terms of revealing information about their services and customers (Tawfeeq et al., 2014). As a result, there is a lack of data in this area compared to other Arab countries.

Khayyat and Heshmati (2012) identified the factors that influence customer satisfaction with mobile phone technology in Kurdistan. They included demographic factors including Age, Gender, Occupation, Educational level, Location, Income and Brand of Cell phone in their model. Demographic factors were included as direct variables affecting user satisfaction. However, providing demographics as moderating factors can bring more accurate results in terms of targeting the factors that are more important for each age group, gender, educational level and people with different income levels (Kalba, 2008). Consistent with previous research, Khayyat and Heshmati (2012) found that the adoption of mobile phones depends on the device and the mobile service. However, the data in their research were collected through telecom companies in Kurdistan, so may not be representative enough.

The Commission of Media and Communications (CMC) was the original ICT regulator in Iraq. Its role in developing the sector was fairly limited (International Telecommunication Union, 2013). The Ministry of Communications overtook this role and is the responsible body for policymaking and regulatory issues in Iraq (Best, 2011). The roles of policymaking and regulations have overlapped in Iraq, leading to a government monopoly (Best, 2011). The study conducted by Best (2011) revealed significant shortcomings in this market which are still present and need to be resolved.

To the best of the researcher's knowledge, no accurate data is available regarding the current spectrum band used in Iraq. Overall, the country suffers from poor ICT policies and a poor regulatory environment, which are affecting the relationship between the Ministry of Communications and the telecommunication companies. The political situation in Iraq has had a significant effect on the telecommunication companies' operations and prices (International Telecommunication Union, 2013). Kurdistan is ruled by a different government, although it is closely connected to the central government of Iraq. The Kurdistan Regional Government has put in place plans to improve the communication sector as a whole. The Kurdistan Regional Government's (2011) report[8] indicated that the main reasons for the increased subscription level in Kurdistan are the reduced price of SIMs, people's interest in using wireless phones and the advantages gained from using them. It was stated in this report that the Kurdistan government has set goals to make the best use of the frequencies available

[8] The report stated "Coverage percentage of these networks ranged from 44% and 89%. The main reason may be attributed to the inexpensive SIM, coupled with people's tendency to have a handheld telephone and use it as a useful and civilised communication tool" (Kurdistan Regional Government, 2011, p.109-110).

for mobile calls and services, raise mobile network coverage to 90%, and to increase regulations and support companies operating in the sector for further price reductions and an increase in service quality (Kurdistan Regional Government, 2011). However, in December 2014, the government of Iraq together with the Kurdistan Regional Government forced additional taxes on mobile and Internet usage which significantly increased the price of using mobile phones and mobile services in the country as a whole. The Iraqi government introduced new taxes to be paid by the sector in 2015, which led to an increase in prices set by mobile companies in the country (www.samenacouncil.org, 2015).

In terms of culture, with reference to Hofstede's cultural dimensions, Iraq scores 95 in Power Distance, 30 in Individualism, 70 in Masculinity, 85 in Uncertainty Avoidance, 25 in Pragmatism (long-term orientation) and 17 in Indulgence (Geert-Hofstede.com, 2014). These scores indicate that Iraq is high in power distance and uncertainty avoidance, a collectivistic, masculine, normative and restraint society.

3.5.2 Jordan

The population of Jordan in 2014 was (7.5m) with a GDP-PPP (Purchasing Power Parity) of (80.2 USD billion) (ASDA'A Burson-Marsteller, 2015). Unemployment among young Arabs aged 15-24 years in Jordan is 33.7% (ASDA'A Burson-Marsteller, 2015). The mobile cellular subscription (per 100 people) was 148 in 2014 in Jordan (World Bank, 2016). Mobile phones have been used in Jordan since 1995 (GSMA, 2015b) and a 4G network with fast connectivity is available there (GSMA, 2015a). Since 2009, mobile penetration in Jordan has exceeded its entire population, with the Jordanian telecommunication market operating since 2003 (Khraim et al., 2011). The main mobile phone operators in Jordan are Zain, Orange Mobile, Umniah and Xpress (Kamli, 2012). Orange is an international company that operates in 27 countries and was the first company to introduce 4G networks in Jordan (www.orange.jo, 2015). Zain had the largest market share in the mobile market in 2011 (Kamli, 2012). In Jordan, 127% of the population have mobile connections and 69% are only mobile subscribers (GSMA, 2015b). Smartphones accounted for nearly a third of the total mobile connections in Jordan (GSMA, 2015b). Jordan has a liberalised telecommunication market (Hakim and Neaime, 2014).

The Telecommunication Regulatory Commission (TRC) was launched in 1998 as a regulator of the sector and spectrum management but was not separated from the Ministry of Information and Communication Technology (MoICT) until 2002. However, the central power is still allocated to the MoICT in Jordan (International Telecommunication Union, 2013).The MoICT is also responsible for creating and developing laws and regulations related to the ICT sector. The competition between telecommunication companies in Jordan has been high since 2005 (GSMA, 2015a). This has contributed to the fast penetration of technological products, despite the fact that Jordan is one of the middle-income Arab countries. However, high taxation exists in Jordan, with an average growth of tax burden on mobile services of 7.7% a year between 2008 and 2012 (GSMA, 2014). In fact, taxes on mobile phones and mobile services in Jordan are among the highest worldwide (GSMA, 2015b). In 2013 and 2015, new regulations for increasing taxes on mobile phones and services were launched (GSMA, 2015a). The taxes on mobile services are extremely high in Jordan, with an increase from 12% in 2010 on calls, SMS and mobile broadband to 24% specific taxes in 2013 and 10% paid by mobile operators, in addition to the General Sale Tax of 16% which is applied to most products (GSMA, 2015a). This has led to a significant increase in prices, which adversely affects affordability, especially with the high unemployment level in Jordan (GSMA, 2015a).

According to Sweis et al. (2013), the available spectrum is not used efficiently in Jordan. Sweis et al. (2013) provided recommendations to improve spectrum regulations, including transparency when awarding licences, diversity of actors to also include non-commercial entities, increasing competition and openness as well as openness specifically for mobile and wireless services by removing restrictions on mobile services and Internet content (requesting operators to block them) as well as open access to the spectrum. The authors also suggested a more efficient use and proper sharing of the existing spectrum and that mobile operators should not be enabled to control mobile services and content. They suggested providing exclusive licences to mobile operators for a shorter time period subject to renewal. This enables the correct planning of the allocation of the spectrum and provides an opportunity to evaluate and update the models used for allocation (Sweis et al., 2013).

In terms of culture, with reference to Hofstede's cultural dimensions, Jordan scores 70 in Power Distance, 30 in Individualism, 45 in Masculinity, 65 in Uncertainty Avoidance, 16 in Pragmatism (long-term orientation) and 43 in Indulgence. These scores indicate that Jordan is high in power distance (Geert-Hofstede.com, 2014). The society in Jordan is collectivistic, feminine, normative and has restraint. Interestingly, the country is intermediate in uncertainty avoidance (scoring lower than the other countries included in the study).

3.5.3 UAE

The population of UAE in 2015 was 9.4m with a GDP-PPP (Purchasing Power Parity) of (604.96 USD billion) (ASDA'A Burson-Marsteller, 2015). The mobile cellular subscription (per 100 people) was 178 in 2014 in UAE (World Bank, 2016). UAE has the highest smartphone adoption level in the world (83%) (GSMA, 2015b). Unemployment among young Arabs aged 15-24 years is 9.9% (ASDA'A Burson-Marsteller, 2014). UAE was selected as 'the country young Arabs like to live in', as they see it as an ideal country with a strong economy and outstanding infrastructure (ASDA'A Burson-Marsteller, 2014). The investigation of ICT adoption in the GCC countries with high potential due to their high GDP has been recommended in previous studies (Rouibah and Hamdy, 2009). The telecom market in UAE is a duopoly between two major companies (Ellam, 2008): Etisalat (Emirates Telecommunication Corporation), the dominant and major player, and du (Emirate Integrated Telecommunication Company PJSC), which started operating in 2005 (Diab, 2010; Kamli, 2012). In 2011, Etisalat had the larger mobile market share in the mobile market in UAE (Kamli, 2012). In UAE, the percentage of mobile connections is 175%, while the percentage of mobile subscribers is 85% (GSMA, 2015b).

4G networks have been launched in UAE with a fast network connection (GSMA, 2015b). UAE leads the Arab world in ICT adoption (Alfaki and Ahmed, 2013). A high number of users in UAE demand prepaid rather than postpaid contract services (Diab, 2010). Ibahrine (2009) stated that Arabs choose prepaid cards instead of contracts due to low income and education levels.

The prices of mobile phones and their services are high. However, due to the high GDP level, a significant number of individuals own more than one mobile device (Sabry et al., 2011). The Ministry of Finance owns 60% of Etisalat, the largest telecom company (Ellam, 2008).[9] Etisalat's operations go beyond UAE to 16 other countries

[9] Ellam (2008) stated, "A royalty fee of 50% of the pre-tax profit makes Etisalat the second largest contributor to the UAE government budget after oil revenues" (p.11).

(even outside the Arab region) (Ellam, 2008). Furthermore, Etisalat's operations extend beyond mobile operations to fixed lines and other services (Ellam, 2008) including Internet, leased and other data services (TRA, 2013). High fees are paid for taxes and regulatory aspects by Etisalat and du (Ellam, 2008). The country is still behind in terms of creating and implementing effective ICT policies (Alfaki and Ahmed, 2013). Although UAE's ICT infrastructure had significant development in the past few years, it is still behind compared to other developed countries (Alfaki and Ahmed, 2013).

The Telecommunication Regulatory Authority (TRA) is the regulatory body in UAE. The TRA is responsible for managing the frequency spectrum in UAE as well as being responsible for all regulatory and policy procedures (TRA, 2013). A number of small licences were granted between 2010 and 2013. However, Etisalat and du remain dominant (TRA, 2014). This indicates a certain level of market monopoly. There are restrictions on Voice Over Internet Protocol (VOIP) applications such as Skype and Viber in order for Etisalat and du to keep dominating the market (Freedomhouse, 2013). A deal took place between the UAE telecom companies and Apple to disable FaceTime from all iPhones in UAE (Freedomhouse, 2015). In 2015, Etisalat decided to provide 20% of its shares so that foreign companies could own them (Freedomhouse, 2015). In UAE, ITU recently allowed Etisalat and du to provide prepaid packages without obtaining regulatory approval. This will allow two Mobile Virtual Network Operators (MVNOs), Virgin and Axiam Telecom, to start offering their services in the future which should result in an increased competition. Nevertheless, Etisalat and du are still mainly owned by the government and dominate the market.

UAE scores 90 in Power Distance, 25 in Individualism, 50 between Masculinity and Femininity and 80 in Uncertainty Avoidance and there were no scores provided for either Pragmatism (long-term orientation) or Indulgence (Geert-Hofstede.com, 2014). These scores indicate that UAE is high in power distance and uncertainty avoidance. The society is collectivistic and neither masculine nor feminine.

Appendix E includes a table that summarises the differences between the three countries included in this research.

3.6 Conclusion

The aim of this chapter was to have a closer look at mobile adoption within the context of the Arab countries. The first part of the chapter showed that the Arab culture is distinguished from Western cultures and has different characteristics which should be considered when studying mobile adoption in this region. Furthermore, it can be argued that although the Arab culture, in general, has similar characteristics, differences still exist in terms of national culture between different Arab countries. Furthermore, the literature review regarding studying culture in IS research and technology adoption revealed that cultural values are better applied at the individual user level. Furthermore, researchers should study the cultural attributes related to the technology under investigation.

Chapter three was included prior to the development of the initial research framework (in Chapter four). The results of the analysis conducted in this chapter showed that when studying mobile phone adoption and use in Arab countries, factors related to culture (more specifically the attributes of the Arab culture that are related to mobile phone adoption) and ICT policies and infrastructure should not be overlooked. In addition, this chapter showed that Iraq, Jordan and the UAE have their own similarities and differences, although they may be thought of as being more different than being similar in many aspects. This research contributes to the existing IS adoption theories and literature by studying aspects of the specific Arab cultural attributes related to mobile phone adoption and use and national IT development which are important areas related to the adoption of mobile phones, as found in this chapter, as well as other technologies in Arab countries. The findings also indicated that the inclusion of such factors in the conceptual framework is important to fill a gap in the existing literature. Therefore, the next chapter (Chapter four) builds on the findings of this chapter and Chapter two by using the UTAUT2 (Venkatesh et al., 2012) as the basis of the conceptual framework and adding new factors related to culture and national IT development to the conceptual framework.

The next chapter in this research is the conceptual framework chapter where a conceptual framework was developed based on the theoretical perspectives developed in chapters two and three in this thesis.

Chapter Four : Conceptual Framework

4.1 Introduction

This chapter lays the basis of the conceptual framework developed in this research. The conceptual framework was mainly based on previous studies related to technology adoption. The main constructs and moderating variables are also outlined in this chapter. The selection of the constructs and the relationships between them is justified. The hypotheses were developed based on what was found in the existing body of literature related to technology adoption, applied to the specific case of the adoption of mobile phones in Arab countries.

4.2 Underpinning of the Conceptual Framework

Göğüş et al. (2012) contended that the wide majority of technology acceptance theories were tested in countries where the infrastructure is well-established in terms of technology education and the skills required. The question regarding their validity in other (less developed) places in the world remains open. Karahanna et al. (1999) contended that differences exist between the pre- and post adoption stages in terms of the factors affecting mobile phone adoption. The conceptual framework was specifically tailored for the adoption and use of smartphones, as they are the new generation of mobile phones which are used among young Arabs who form the target participants in this research. Smartphones are the future of mobile phones in Arab countries. Therefore, the model included items related to mobile applications as well as the device itself.

By comparing the existing relevant technology acceptance theories (as shown in the table in Appendix F), it can be concluded that none of them can fully explain and predict mobile phone acceptance in Arab countries. However, UTAUT2 developed by Venkatesh et al. (2012) is largely applicable to the studied case with some modifications and additional constructs that must be added in order to address the individual consumer in an Arab country. UTAUT2 (discussed in Sections 2.2.9 and 2.2.10), which was originally tested using mobile Internet in Hong Kong, can be largely applicable to the context of mobile phone adoption in Arab countries.

There are many reasons for choosing UTAUT2 to form the basis of the conceptual framework in this research. First, it was originally UTAUT (Venkatesh et al., 2003) which was based on comparing, combining and analysing eight widely acknowledged technology acceptance theories in the existing body of literature and their extensions. The model combines the concepts from these theories, which may have used different labels but thematically overlapped. Second, the model provides a more in-depth understanding of the needs of individual consumers, as it includes the moderating factors age, gender and experience, which allow the acknowledgement and identification of differences between individual users. Third, the framework created by Venkatesh et al. (2012) was tested using mobile Internet, which is not completely different from the context of mobile phone technology adoption, and was tested using actual users (customers' perspective). In addition, Venkatesh et al. (2012) suggested testing the theory in different countries. Based on these reasons, UTAUT2 was selected to form the basis of the framework developed in this study. The analysis of the main TA theories included in Appendix F showed that none of them included factors related to cultural attributes related to technology adoption and use or factors related to national IT development, which mainly apply to developing countries, specifically Arab countries. UTAUT2 lacks these factors, too. Accordingly, new constructs were adopted from the Cultural Influence Model for Information

Technology Transfer developed by Straub et al. (2001) discussed in Chapter Three, which was specifically developed for technology transfer to the Arab countries. These new constructs including National IT development, Technological Culturation and Culture-Specific Beliefs and Values were added to the existing constructs of UTAUT2.The incorporation of these three factors strengthens the research and provides an increased support for UTAUT2 within the context of mobile phone adoption and use by young Arabs in Arab countries. Although the work carried out by Straub et al. (2001) and Loch et al. (2003) was mainly for an organisational setting, it can still be implemented in the case of the individual user, with some modifications to fit the topic of mobile phone adoption for the individual user.

There were many reasons for combining the Cultural Influence Model for Information Technology Transfer, in particular, with UTAUT2 in this research. First, the model was developed for developing countries, specifically Arab countries. Second, the model encounters and acknowledges the complex nature of the Arab culture and its effect on technology transfer. The results of the analysis of the literature carried out in Section 3.3 showed that the effect of culture cannot be overlooked when studying mobile phone adoption and use in Arab countries. Third, the model acknowledges National IT Development as a construct, although not tested in Straub et al.'s (2001) research, which the literature review conducted in Section 3.4 showed that it is an important area that must be addressed when studying mobile phone adoption and use in Arab countries. The study conducted by Loch et al. (2003) outlined the measures of the National IT Development construct developed by Straub et al. (2001). Many of these measures were found to be strictly related to the case of mobile phone adoption in Arab countries (as found in Section 3.4). In addition, new moderating variables were included (education and income) as they apply to the case of young users in the Arab countries.

A gender divide exists in Arab countries which makes the investigation of different factors affecting mobile adoption for different genders in these countries mandatory. Gender, within the context of the Arab countries, was expected to be a significant moderating factor. Also, women have fewer chances of obtaining jobs in Arab countries and are more restricted due to culturally related factors. Gender can be a significant moderating factor in Arab countries due to the differences found between males and females in the region (as found in Kamel and Farid's (2007) study). In fact, both gender and age were found important in Venkatesh and Morris's (2000) study. Another moderator included in this research framework was experience. Experience has proved to be important in many previous studies (i.e. Wu and Wang, 2005; Park et al., 2009). Nevertheless, previous studies have explained that it is difficult to capture experience and include it in TA models, for example Thompson et al. (2006). Experience can be categorised into different categories: length of time the technology has been in use, frequency of use and diversity of use (Hurtienne et al., 2010). Education was a significant factor in Göğüş et al.'s (2012) study and mobile adoption in Khayyat and Heshmati's (2012) study. Income was expected to be a significant moderating factor for users in the Arab countries as they are developing countries where the income level is less than developed countries. Also, the unemployment level in some of these countries is relatively high (Roy et al., 2011; ASDA'A Burson-Marsteller, 2015) which makes the inclusion of income in the research model even more important. The inclusion of demographic factors is crucial for obtaining accurate results and a more focused approach (Kalba, 2008). It allowed the researcher to identify the context in which a relationship between two factors becomes significant.

This research attempts to apply simple modifications to UTAUT2 to create a new model: the Mobile Phone Acceptance and Usage Model (MPAUM). The UTAUT model has been adopted and modified extensively within the existing body of literature (as discussed in Sections 2.2.9 and 2.2.10). A limitation of all the studies that extended or modified UTAUT in the Arab countries was the focus on one country, one specific mobile service or application and collecting data from students or employees. This research is a step forward in understanding mobile phone adoption and use in general for a specific age group that forms the highest segment of the Arab population by comparing and contrasting mobile phone adoption in three Arab countries.

The proposed conceptual framework is directly linked to the aim and objectives of this research. The current research aims to enhance knowledge on the topic of technology acceptance by proposing and examining a conceptual model explaining the factors that can predict young Arabs' Behavioural Intention (BI) and Actual Use (USE) of mobile phones, more specifically the new generation of mobile phones, smartphones, in Iraq, Jordan and UAE. The proposed conceptual framework aims towards achieving the aim of this research. Additionally, it links directly to the objectives of this research (in Section 1.4). The conceptual framework is based on an extension of the UTAUT2 model within the context of mobile phone adoption and use in Iraq, Jordan and UAE (objective one). In addition, the conceptual framework includes the factors that can affect young Arabs' mobile phone adoption and use in the three countries (objective two). Based on the findings regarding the significance of these factors in each of the three countries, insights into future trends in mobile phone adoption and use for companies currently operating or willing to operate in the region were provided.

The literature review conducted in this research showed that a number of technology acceptance theories have been developed and validated for investigating the adoption of technologies. In addition, some of these theories, namely UTAUT and UTAUT2, have been tested within the context of individual mobile applications in Arab countries, for example; mobile banking in Jordan (Abu-Shanab and Pearson, 2007; Abu-Shanab and Pearson, 2009; Abu-Shanab et al., 2010; Al Mashaqba and Nassar, 2012; Al-Qeisi et al., 2014; Alalwan et al., 2014), different systems in Saudi Arabia including mobile commerce (Alkhunaizan and Love 2012), mobile learning (Nassuora, 2012), mobile exchange (Al Otaibi, 2013), mobile government (Baabdullah et al., 2015), mobile learning (Badwelan et al., 2016), different systems in Iraq for example mobile learning in higher education (Jawad and Hassan, 2015).. These studies highlighted the significance of the UTAUT and UTAUT2 in explaining individual's technology adoption. Also, the importance of the UTAUT and its extended ability in explaining technology acceptance was highlighted in present literature (e.g. Dwivedi et al., 2011; Williams et al., 2015; AlQeisi et al., 2015) due to its ability to capture the most important factors found in previous technology adoption theories and integrating them in one model. However, there is a lack of research that studies the adoption of smartphones (including the adoption of the handset as well as mobile applications which apply to smartphones in order to fully understand this phenomenon) in a cross national research within the Arab region. In addition, there is a gap in the existing technology acceptance theories in terms of the integration of factors related to culture (which are specifically related to the technology under investigation) and national IT development.

The UTAUT2 developed by Venkatesh et al. (2012) included seven main exogenous factors namely; Effort Expectancy (EE), Performance Expectancy (PE), Hedonic

Motivation (HM), Price Value (PV), Social Influence (SI), Facilitating Conditions (FC) and Habit (HT), two endogenous factors including Behavioural Intention (BI) and Actual Use (USE) and three moderators including; age, gender and experience. The literature review conducted in this research showed that there is a gap in the existing technology acceptance theories in terms of integrating factors related to culture (more specifically the cultural attributes related to Arabs' mobile phone adoption and use) and national IT development which the literature review conducted in Chapter three in this research showed that they are important factors to consider for the case of young Arabs' mobile phone adoption and use. The contribution of this research lies in the integration of three independent factors in the conceptual framework including; Technological Culturation (TC), Culture-Specific Beliefs and Values (CSBV) and National IT Development (ND) and two additional moderating factors including income and education (highlighted in red in figure 4.1). In addition, some items of the existing constructs of the UTAUT2 were modified and new items were added to fit the context of this research. The conceptual framework contributes to the existing literature as it fills the gap in the literature by integrating factors related to culture and national IT development within the context of young Arabs' mobile phone adoption and use in Iraq, Jordan and UAE.

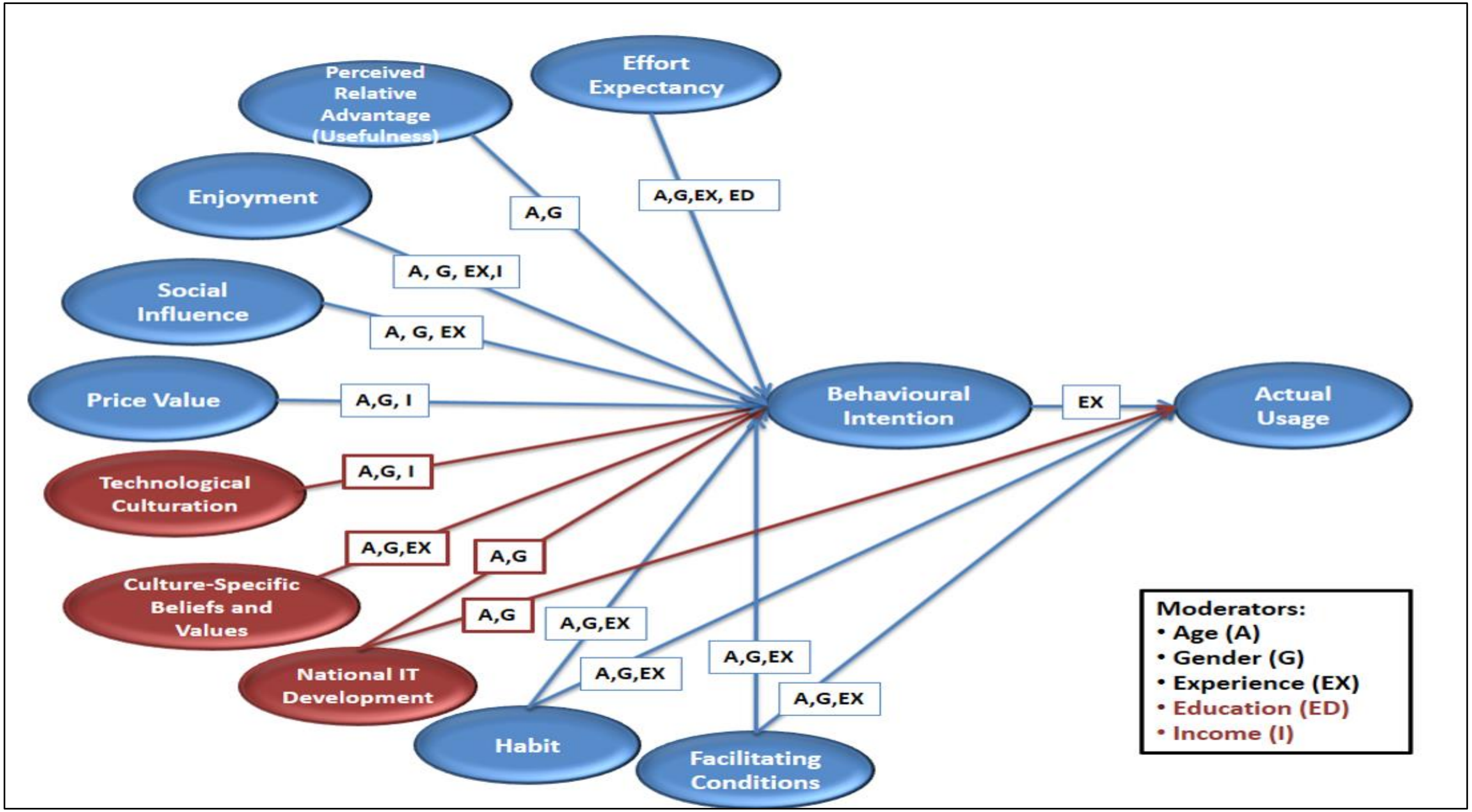
As stated earlier, the UTAUT2 developed by Venkatesh et al. (2012) included seven main exogenous factors namely; Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI), Facilitating Conditions (FC), Habit (HT), Hedonic Motivation (HM) and Price Value (PV). Rogers (2003, p. 229) defined Relative Advantage as "the degree to which an innovation is perceived as being better than the idea it supersedes." Moore and Benbasat (1991) suggested that the term Relative Advantage is more detailed and perceptive to the user than the term Perceived

Usefulness. Based on this suggestion, Igbal and El-Gohary (2014) used the term Perceived Relative Advantage (usefulness). Following their approach, in this research, the term **Perceived Relative Advantage** was used to represent the term ‘Performance Expectancy’ in the UTAUT2 (Venkatesh et al., 2012). **Effort Expectancy** is defined as “the degree of ease associated with consumers’ use of technology” (Venkatesh et al., 2012, p.159). It has been found to be significant in the UTAUT2 (Venkatesh et al., 2012) and in many other studies (e.g., Davis, 1989; Davis, Bagozzi and Warshaw, 1992; Taylor and Todd, 1995b; Taylor and Todd, 1995c; Venkatesh and Davis, 2000). It was anticipated that Effort Expectancy would also be important within the context of this research. **Social Influence** has been defined as “the extent to which consumers perceive that important others (e.g., family and friends) believe they should use a particular technology” (Venkatesh et al., 2012, p.159). It has been found in many existing theories related to technology adoption, including the TRA (Ajzen and Fishbein, 1980), the SCT (Bandura, 1986; Compeau and Higgins, 1995), the TPB (Ajzen, 1991); the MPCU (Thompson et al., 1994), the DoI (Rogers, 2003), the UTAUT (Venkatesh et al., 2003), and the UTAUT2 (Venkatesh et al., 2012). **Facilitating Conditions** have been defined as “consumers’ perceptions of the resources and support available to perform a behavior” (Venkatesh et al., 2012, p.159). The construct of Facilitating Conditions was found in the MPCU (Thompson et al., 1994), the DTPB (Taylor and Todd, 1995b), the UTAUT (Venkatesh et al., 2003), and the UTAUT2 (Venkatesh et al., 2012). Hedonic Motivation has been defined by Venkatesh et al. (2012, p.161) as “the fun or pleasure derived from using a technology.”. Previous studies have found **Enjoyment** to be significant (e.g., Kamel and Farid, 2007; Venkatesh et al., 2012). **Price Value** has been defined as “consumers’ cognitive trade-off between the perceived benefits of the applications and the monetary cost for using them" (Venkatesh et al., 2012, p.161). It was found to have an important effect on Behavioural Intention in the UTAUT2 (Venkatesh et al., 2012). Price Value was expected to be a significant factor in the case of mobile phone users in Arab countries. This is due to the high unemployment level and low economic status in comparison with developed countries (GSMA, 2015a). Based on Limayem et al.'s (2007) findings, **Habit** was defined in Venkatesh et al.'s (2012, p.161) study as "the extent to which people tend to perform behaviors automatically because of learning.". Habit was found to be important in the UTAUT2 (Venkatesh et al., 2012). The direct effect of Habit on Actual Use without the mediation of Behavioural Intention is also discussed in Limayem et al.'s (2007) study; that is, when a habit is formed (by the frequent use of technology over a certain period of time in a stable environment), it becomes a key driver of Actual Use, which can override the effect of Behavioural Intention.

The above factors were part of the UTAUT2 model developed by Venkatesh et al., (2012). The contribution of this research lies in the integration of three additional independent factors to the UTAUT2 in the conceptual framework including; Technological Culturation, Culture-Specific Beliefs and Values and National IT Development. **Technological Culturation** has been defined as "influential experiences that individuals have had with technologically advanced cultures" (Straub et al., 2001, p.9). The construct was found to be significant in Straub et al.'s (2001) model. In fact, the authors found that Technological Culturation had a significant effect on system outcomes and information technology transfer. Technological Culturation has been found to be significant in previous studies, including the study conducted by Hill et al. (1998). The extent to which individuals are exposed to advanced technologies in foreign, developed countries can have a significant effect on the use of technology. Straub et al. (2001, p.9) defined **Culture-Specific Beliefs and Values** as “those specific beliefs, values and meanings that are thought to have a downstream effect on the use of information systems.” However, the culture-specific belief ‘time for planning’ may not apply to mobile phone adoption, as there is no time required for planning by the individual user. Culture-Specific Beliefs and Values were found to be important in the studies conducted by Hill et al. (1998), Straub et al. (2001) and Loch et al. (2003). The present framework included a new construct: **National IT Development**. This construct has been defined by Straub et al. (2001, p.9) as “specific technology policies that guide the development of information systems in a specific country together with the existing structure of computing and communication capabilities and the ability of the population to operate and utilize these capabilities. The overall construct reflects the level of support for technological development within a given nation.”. Although this construct was not tested in Straub et al.’s (2001) study, it may well apply to the case of Arab people’s use of mobile phones. The construct refers to national IT policies and technological infrastructure. It refers to the effect of the development of ICT systems and policies in Arab countries on consumers’ Behavioural Intention towards Actual Use.

The components of the conceptual framework are shown in Figure 4-1.

Figure 4-1: Conceptual Framework



4.3 Research Hypotheses

The proposed conceptual framework was developed to achieve the research objectives outlined in Chapter One, in order to address the objectives of this study and as the conceptual framework was based mainly on Venkatesh et al. (2012) and Straub et al.'s (2001) models.

The hypotheses developed in this research are directly linked to the objectives of this research (in Section 1.4). H1 is directly linked to objectives two and three. To analyse the factors that can affect Behavioural Intention and Actual Use of mobile phones (objective two), testing that mobile phones are accepted and used by young Arabs in Iraq, Jordan and UAE is crucial. Also, to examine young Arab customers' perceptions of the obstacles facing mobile phone adoption and use in Iraq, Jordan and UAE (objective three), establishing that they accept and use mobile phones is required.

H2 is directly linked to the first objective in this research. H2 was developed to examine the viability of the UTAUT2 and extend it within the context of mobile phone adoption and use in the three Arab countries. Testing that the proposed model, which is based on an extension of the UTAUT2 explains young Arab customers' acceptance of mobile phones in Iraq, Jordan and UAE helps to examine the viability of the UTAUT2 and the extension proposed in this research.

The remaining hypotheses (H3 to H16) and the sub-hypotheses for testing the moderators' effects were developed to achieve objectives one and two. H1 to H16 were developed to test the significance of the effects of different factors on BI and USE within the context of mobile phone adoption and use (objective two). Some of these factors were adopted from the UTAUT2 and extended with the additional factors (TC, CSBV and ND) and the additional moderators (income and education). Accordingly, these hypotheses also covered objective one; to examine the viability of the UTAUT2 and extend it within the context of mobile phone adoption and use in the three Arab countries. The sub-hypotheses were developed to test the effects of the moderators on the relationships between the factors in the model to enable the researcher to identify the context within which the relationship between two factors in the model becomes significant. This helped to accurately achieve the first and second objectives in this research as examining the viability of the UTAUT2 requires the inclusion of the main moderators that were present in the UTAUT2 (objective one). Also, the inclusion of the moderators helped to accurately analyse the factors that can affect BI and USE of mobile phones (objective two). The hypotheses developed in this study are:

1. The model's ability to explain and predict the acceptance and use of mobile phones

The main hypothesis was developed to test the model's ability to explain and predict customers' acceptance and use of mobile phones. After developing the model in a way that fits mobile acceptance and usage by young Arabs in Arab countries, it became vital to test whether the model (as a whole) is able to explain the predictive customer's mobile acceptance and usage in the three Arab countries. This was achieved by testing the following two hypotheses:

H1: Young Arabs in Iraq, Jordan and UAE accept and use mobile phones

H2: The proposed model explains young Arab customers' acceptance of mobile phones in Iraq, Jordan and UAE

2. The predictive level of the dependent variable in the model

   Behavioural Intention is one of the dependent variables in this study, as it is affected by the independent variables. In this study, Behavioural Intention is affected by the ten independent variables. Attitude has been found to be significant in many of the existing technology acceptance theories, for example TRA (Fishbein and Ajzen, 1975; Ajzen and Fishbein, 1980); TAM (Davis, 1989); TPB (Ajzen, 1991); A-TAM (Taylor and Todd, 1995c) and DTPB (Taylor and Todd, 1995b). Venkatesh et al. (2003) found that Attitude does not have a significant effect on Intention. They stated that Attitude can be found within the effects of Performance Expectancy and Effort Expectancy. This study did not include Attitude. Instead, following Venkatesh et al.'s (2012) findings, the research framework included **Behavioural Intention (BI)** to mediate between the independent variables in the model and **Actual Usage (USE)**. Behavioural Intention has been found to be significant in many theories related to technology acceptance including TRA (Fishbein and Ajzen, 1975; Ajzen and Fishbein, 1980); TAM (Davis, 1989); TPB (Ajzen, 1991); Motivational Model (Davis et al., 1992); DTPB (Taylor and Todd, 1995b); TAM2 (Venkatesh and Davis, 2000); UTAUT (Venkatesh et al., 2003); UTAUT2 (Venkatesh et al., 2012) and MOPTAM (Van Biljon and Kotze, 2008). Based on the above, it was hypothesised that:

   H3. Behavioural Intention to use mobile phones has a positive significant direct effect on Actual Usage

   Experience was found to moderate the effect of Behavioural Intention on Actual Usage in UTAUT2 (Venkatesh et al., 2012). The less experience individuals have, the stronger the effect of Behavioural Intention and Actual Use becomes. Therefore, it was hypothesised that:

H3a. Experience moderates the effect of Behavioural Intention on Actual Use such that this effect is stronger among individuals with a low level of experience.

3. Impact of independent variables on Behavioural Intention

Perceived Relative Advantage (PRA) usefulness stems from Perceived Usefulness and Performance Expectancy which have proved to be important in previous technology acceptance theories (e.g., Davis, 1989; Venkatesh et al., 2012; Alwahaishi and Snášel, 2013). Previous studies showed that Perceived Usefulness was found to be a significant determinant of Behavioural Intention (Davis, 1989; Adams et al., 1992; Davis and Venkatesh, 1996). Similarly, PRA (usefulness) adapted from Moore and Benbasat's (1991) study was expected to have a significant effect on Behavioural Intention in this study. Wang et al. (2011) studied the relationship between PRA and Perceived Usefulness. They stated that the two terms are usually used interchangeably when studying the adoption of technology. However, relative advantage is more accurate, as it includes other competing technologies, too, especially the idea that mobile phones and their services have other ICT rivals too. Following Igbal and El-Gohary's (2014) approach, who named Perceived Usefulness "perceived relative advantage (usefulness)" (p.244), based on the findings of the previous research carried out by Moore and Benbasat (1991), the authors suggested that the term relative advantage is more detailed and perceptive to the user. In this research, the term 'Perceived Relative Advantage' was used to represent the term Performance Expectancy in UTAUT2 (Venkatesh et al., 2012). For the purpose of this research which studies mobile phone adoption by young Arabs, the following hypotheses were developed:

H4: Perceived Relative Advantage (usefulness) has a positive significant effect on Behavioural Intention.

Venkatesh et al. (2003) found that the effect of Performance Expectancy was influenced by age and gender such that it is higher among younger individuals and men, thus:

H4a. Age and gender moderate the effect of Perceived Relative Advantage (usefulness) on Behavioural Intention such that this effect is stronger among younger individuals and men.

Effort Expectancy (EE) was found to be significant in UTAUT2 (Venkatesh et al., 2012) and many other studies (e.g., Davis, 1989; Davis et al., 1992; Taylor and Todd, 1995c; Taylor and Todd, 1995b; Venkatesh and Davis, 2000). Within the context of young users in Arab countries, Effort Expectancy was expected to be important. Thus, it was hypothesised that:

H5. Effort Expectancy has a positive significant effect on Behavioural Intention

Factors can moderate the relationship between Effort Expectancy and Behavioural Intention. Age, gender and experience were found to have moderating effects on the relationship between Effort Expectancy and Behavioural Intention (Venkatesh et al., 2003). The authors found that the effect of Effort Expectancy is stronger among older women with a low level of experience. In this research, education is also included as a factor moderating the effect of Effort Expectancy on Behavioural Intention. Highly educated people use technologies earlier than less educated people, as they find them easier to learn (Porter and Donthu, 2006). The lower the level of education, the stronger the effect of Effort Expectancy becomes. Thus, it was hypothesised that:

H5a. Age, gender, experience and education moderate the effect of Effort Expectancy on Behavioural Intention such that this effect is stronger among older individuals, women, individuals with a low experience level and individuals with a low education level.

Social Influence (SI) has been found in many existing theories related to TA including TRA (Fishbein and Ajzen, 1975; Ajzen and Foshbein, 1980); SCT (Bandura, 1986; Compeau and Higgins, 1995a); TPB (Ajzen, 1991); MPCU (Thompson et al., 1991; Thompson et al., 1994); DTPB (Taylor and Todd, 1995b); TAM2 (Venkatesh and Davis, 2000); DoI (Rogers, 2003); UTAUT (Venkatesh et al., 2003); UTAUT2 (Venkatesh et al., 2012) and MOPTAM (Van Biljon and Kotze, 2008). Although Social Influence was not included in TAM, Davis et al. (1989) recommended the inclusion of this factor to account for the effect of the external environment surrounding the user. Social Influence is a factor that can determine Behavioural Intention. In this research, it was hypothesised that:

H6. Social Influence has a positive significant effect on Behavioural Intention

Venkatesh et al. (2003) found that the effect of Social Influence on Behavioural Intention is influenced by the moderating factors age, gender and experience, as it is stronger among older women with a low level of experience. Thus, it was hypothesised that:

H6a. Age, gender and experience moderate the effect of Social Influence on Behavioural Intention such that this effect is stronger among older individuals, women and individuals with a low level of experience.

Facilitating Conditions (FC) was found to be significant in both UTAUT and UTAUT2 for the customer's case. The construct FC was found in MPCU (Thompson et al., 1991; Thompson et al., 1994); DTPB (Taylor and Todd, 1995b); A-TAM (Taylor and Todd, 1995c); DoI (Rogers, 2003); UTAUT (Venkatesh et al., 2003); UTAUT2 (Venkatesh et al., 2012) and MOPTAM (Van Biljon and Kotze, 2008). Venkatesh et al. (2012) found that Facilitating Conditions have a significant effect on Behavioural Intention and a direct significant effect on Actual Use for the case of the individual user. For the purpose of this research, and to ensure that all the possibilities are included, the effect of Facilitating Conditions on both Behavioural Intention and Actual Use were tested. Thus, two hypotheses were developed:

H7. Facilitating Conditions have a positive significant effect on Behavioural Intention.

H8. Facilitating Conditions have a positive significant direct effect on Actual Usage.

Age and gender were found significant when studying the effect of Facilitating Conditions in Venkatesh et al.'s (2012) study in that it is more significant for older women. Although experience was not significant, this moderator was found to have an important moderating effect on the relationship between Facilitating Conditions and Behavioural Intention and Actual Usage in such a way that Facilitating Conditions have a significant effect on Behavioural Intention and Actual Usage among less experienced people. Therefore, it was hypothesised that:

H7a. Age, gender and experience moderate the effect of Facilitating Conditions on Behavioural Intention such that this effect is stronger among older individuals, women and individuals with a low level of experience.

H8a. Age, gender and experience moderate the effect of Facilitating Conditions on Actual Usage such that this effect is stronger among older individuals, women and individuals with a low level of experience.

Enjoyment (Enj) was expected to be important for the adoption of mobile phones due to the high number of mobile applications for gaming and entertainment. Enjoyment has been found to be significant in previous studies (e.g., Nysveen et al., 2005a; Kamel and Farid, 2007; Ha et al., 2007; Khayyat and Heshmati, 2013). It was represented as Hedonic Motivation in UTAUT2 (Venkatesh et al., 2012). Enjoyment was distinguished from Performance Expectancy and was found to be important for the case of customers' acceptance and usage of mobile Internet (Venkatesh et al., 2012). Accordingly, it was hypothesised that:

H9. Enjoyment has a positive significant effect on Behavioural Intention

Age, gender and experience moderate the effect of Enjoyment on Behavioural Intention in such a way that it is stronger among younger individuals, men and individuals with a low level of experience (Venkatesh et al., 2012). In addition, within the context of this study, the effect of Enjoyment on Behavioural Intention can become stronger among higher income level users, as they can afford to pay more. Therefore, it was hypothesised that:

H9a. Age, gender, experience and income moderate the effect of Enjoyment on Behavioural Intention such that this effect is stronger among younger individuals, men, individuals with a low level of experience level and individuals with a high income level.

Price Value (PV) was found to have an important effect on Behavioural Intention in UTAUT2 (Venkatesh et al., 2012). Van Biljon and Kotze (2008) explained that it is relevant to the individual's mobile adoption case, along with infrastructure and service. The price factor has been highlighted in previous studies (e.g., Mallenius et al., 2007; Kamel and Farid, 2007; Kalba, 2008; Alrawabdeh et al., 2012; UNDP, 2013; International Telecommunication Union, 2013; Hakim and Neaime, 2014). Price Value has been found to be important for the Arab user in previous studies (e.g., Kamel and Farid, 2007; Puumalainen et al. 2011; Alrawabdeh et al., 2012). Users compare the benefits of using mobile phones and applications to their cost. Accordingly, it was hypothesised that:

H10. Price Value has a positive significant effect on Behavioural Intention

Venkatesh et al. (2012) found that Price Value is affected by age and gender in such a way that its effect on Behavioural Intention is higher among older women. In this research, it is further hypothesised that the effect of Price Value is moderated by income. As income increases, Price Value becomes less of an issue. However, there have been different views regarding income; for example, Alwahaishi and Snášel

(2013) indicated that price is important even among higher income people. This was investigated further in this research. Therefore, it was hypothesised that:

H10a. Age, gender and income moderate the effect of Price Value on Behavioural Intention such that this effect is stronger among older individuals, women and individuals with a low income level.

Habit (HT) was found important in UTAUT2 (Venkatesh et al., 2012). It was also partially found in MPCU (Thompson et al., 1991). Although Carbonell et al. (2013) stated that it may not be completely appropriate to call extensive use of mobile phones 'addiction' to the device usage, the authors emphasised that developing a habit where a mobile phone is overused automatically exists and changes people's behaviour. The direct effect Habit has on Actual Use without the mediation of Behavioural Intention was also discussed in Limayem et al.'s (2007) study; that is when Habit is formed (by the frequency of use of technology for a certain period of time in a stable environment), it becomes a key driver of Actual Use that can override the effect of Behavioural Intention. The effect of Habit on both Behavioural Intention and Actual Usage was tested following the research carried out by Venkatesh et al. (2012). Therefore, the following hypotheses were tested:

H11. Habit has a positive significant effect on Behavioural Intention

H12. Habit has a positive significant direct effect on Actual Usage

Age, gender and experience were found to moderate the effect of Habit, which is stronger among older men with a higher level of experience (Venkatesh et al., 2012). Therefore, it is hypothesised that:

H11a. Age, gender and experience moderate the effect of Habit on Behavioural Intention such that this effect is stronger among older individuals, men and individuals with a high level of experience.

H12a. Age, gender and experience moderate the effect of Habit on Actual Usage such that this effect is stronger among older individuals, men and individuals with a high level of experience.

In their study, Yang and Lee (2006) compared mobile cellular phone adoption in the USA and Korea. The authors found that differences in technology adoption exist between the two countries. One of the main findings of their research was that the digital divide can be caused by the environment that surrounds the user. They found that the first stage of adoption was similar between the two countries, then differences started to occur. This shows that the role of the environment around the user cannot be neglected. Straub et al. (2001) and Loch et al. (2003) contended that when studying technology adoption, the national characteristics of each country in terms of technology must be studied separately in order to provide accurate results. The effect of culture, regulation liberty and the infrastructure of the country were found to be significant factors for technology adoption in the Middle East countries (Baabdullah et al., 2013). Therefore, three new constructs were included: Culture-Specific Beliefs and Values, Technological Culturation and National IT Development.

Technological Culturation (TC) has been found to be significant in previous studies including Hill et al. (1998) and Straub et al. (2001). This construct was incorporated into the research model developed here as it was expected to be applicable to the case of customers in Arab countries. This research studied the effect of informal technological culturation. The extent to which individuals are exposed to advanced technologies in foreign developed countries has proved to have a significant effect on technology usage. With reference to Straub et al.'s (2001) categorisation of Technological Culturation, this research only included informal technological culturation, which is related to the individual consumer rather than an employee in a work setting. Informal Technological culturation proved to be significant in Straub et al.'s (2001) study, in terms of interacting with friends and family and travelling abroad for business or pleasure. Within the context of the Arab countries, technological culturation can take another form. The telecom markets in Arab countries can be open to foreign telecom companies to invest in, which may, in turn, provide people in these countries with the opportunity to be introduced to and experience new advanced technologies in a new and less costly fashion. Openness to foreign investment can also be part of Technological Culturation. The items of this construct were adopted from Straub et al.'s (2001) study, including extent of travel for business, extent of travel for pleasure, extent of contact with family and members residing abroad and reading foreign technology journals. The research studied the effect of Technological Culturation on Behavioural Intention. It was hypothesised that:

H13. Technological Culturation has a positive significant effect on Behavioural Intention

For culture-related reasons (as discussed in Chapter Three), women in Arab countries do not travel as frequently as men, and by law, they cannot travel unless their husbands agree (Kirdar, 2010). In addition, Arab men are generally responsible for providing the finances required for the family (Kirdar, 2010). Therefore, it can be contended that the effect of Technological Culturation is stronger amongst men. As younger people are more familiar with technology (Alkhunaizan and Love, 2012), Technological Culturation becomes significant among younger individuals. Higher income people can afford to travel to more technologically advanced countries. Therefore, the effect of Technological Culturation was expected to be higher among higher income level people. Thus, it was hypothesised that:

H13a. Age, gender and income moderate the effect of Technological Culturation on Behavioural Intention such that this effect is stronger among younger individuals, men and individuals with a high income level.

Culture-Specific Beliefs and Values (CSBV) were found important in the studies conducted by Hill et al. (1998), Straub et al. (2001) and Loch et al. (2003). This construct was included in the conceptual framework in this research as it was expected to be significant for the case of Arab users due to the nature and characteristics of the Arab culture. However, this may not apply to all users, as it is the individual's choice whether to accept the cultural values, and their own culture should be studied at the individual user level (as discussed in Chapter Three). **Culture-Specific Beliefs and Values (CSBV)** were included in the research framework. Straub et al. (2001) contended that studying culture as a whole is too generic and misleading. Therefore, when studying the effect of culture on technology adoption, it is more accurate to use the term ‘Culture-Specific Beliefs and Values’ to indicate that the study only includes the aspects of culture that are related to the specific technology to be adopted. Straub et al. (2001) used the “Arab sense of time” (p.9) as the basis for Culture-Specific Beliefs and Values. However, they stated that other aspects of culture related to technology adoption can also be applied and studied. Straub et al. (2001) found that Culture-Specific Beliefs and Values have an effect on 'IT System Outcomes', which the authors referred to as Actual Use or Intention to use a technology system. Rose and Straub (1998) and Straub et al. (2001) indicated that preference for face-to-face meetings is an important Arab cultural value. In this research, the effect of Culture-Specific Beliefs and Values was expected to have an effect on Behavioural Intention. The selected Culture-Specific Beliefs and Values related to mobile phone adoption included in this study were **Face-to-face versus technology-mediated meetings,** which are closely related to people's choice to adopt and use mobile phones. It is important to stress that mobile devices are only supplementary to actual face-to-face communications. Straub et al. (2002) recommended studying a subset of cultural values at the individual level that are related to the key area of enquiry. Therefore, one subset of the Arab cultural values (preference for face-to-face meetings or technology-mediated meetings) was included in this research and tested at the individual user level, as it is related to the context of mobile phone adoption and usage in Arab countries. Face-to-face interaction was identified by Hill et al. (1998) as crucial for technology transfer and adoption in Arab countries. Therefore, it is important to understand how this can affect mobile phone adoption and use within such a culture.

In this research, Culture-Specific Beliefs and Values took the form of face-to-face vs. technology-mediated meetings, as it was expected to be related to mobile phone adoption and was tested at the individual user level. Arabs are known for their preference for face-to-face meetings (Enterprise Ireland, 2013). This was expected to have an effect on mobile phone adoption in these countries. Based on previous work such as Ali's (1990) study which described characteristics of the Arab culture, Arabs' preference for face-to-face meetings was expected to have a significant effect on mobile phone adoption. Therefore, the following hypothesis was developed:

H14. Culture-Specific Beliefs and Values have a positive significant effect on Behavioural Intention

Although prior research did not indicate the existence of any effect of moderating factors on the relationship between Culture-Specific Beliefs and Values and Behavioural Intention, these were included based on the previous literature generated in relation to technology adoption in Arab countries. Since older people are less familiar with and have a lower level of technology usage (Alkhunaizan and Love, 2012), preference for face-to-face meetings rather than technology-mediated ones was expected to be higher among older people.

Gender differences exist in terms of culture in Arab countries. Women are less powerful and less independent than men (Kirdar, 2010), and they are more reserved. Therefore, it can be contended that preference for face-to-face meetings is higher among men. This means that preference for technology-mediated meetings is stronger among women, especially when they are more restricted than men. As experience increases, people's use of mobile technologies increases (Venkatesh et al., 2012). This, in turn, can decrease their preference for face-to-face meetings. Therefore, people with low experience using mobile phones and their applications have less preference for technology-mediated meetings. Thus, it was hypothesised that:

H14a. Age, gender and experience moderate the effect of Culture-Specific Beliefs and Values on Behavioural Intention such that preference for mobile mediated meetings is stronger among younger individuals, women and individuals with a high level of experience.

The present framework included a new construct called **National IT Development (ND)**. The construct refers to National IT Policies and Technological Infrastructure. This included the analysis of the effect of policies and development of ICT systems in an Arab country on consumers' Behavioural Intention towards usage. The items for this construct in Loch et al.'s (2003) study were privatisation of IT industries, perception of current demand for IT, perception of current supply for IT, government IT initiatives, taxation of IT imports and other IT tariffs and restrictions, software piracy enforcement, tax benefits of IT use (Loch et al., 2003). Some of these items which apply to mobile phone technology and the individual consumer were adopted in this research. The researcher investigated some aspects of this construct which consumers could provide information about. The researcher investigated young Arabs' opinions on the tariffs, restrictions, taxations, privatisation and competition in the IT industry and their perceptions of current supply and demand for IT. The literature review related to Arab countries showed that gaps exist in these areas. In addition, the level of IT development, policies and infrastructure varies among Jordan, Iraq and UAE. Therefore, these variations and their effect on mobile phone adoption and use are expected to be revealed in more depth from the young Arabs' perspective. Based on the analysis of the literature and reports related to IT infrastructure in Arab countries (in Section 3.4), it was expected that the **National IT Development (ND)** construct in the research framework would be particularly important. Furthermore, national IT development is different in these countries from the more developed countries in terms of privatisation, competition, taxation, supply and demand. These were investigated from the consumer's point of view. National IT Development was included in the studies conducted by Straub et al. (2001) and Loch et al. (2003). However, the construct was not investigated and tested.

This study provides an extension to these studies by analysing the effects of this construct on Behavioural Intention and Actual Usage for young Arab individuals. The reason for testing the effect of National IT Development on Actual Usage as well is that this construct was expected to affect how young people use their mobile phones (smartphones), for example the frequency of usage or use of different mobile applications in terms of mobile tariffs or restrictions. The measurement items related to this construct were adopted from Loch et al.'s (2003) study. It was hypothesised that:

H15. National IT Development has a positive significant effect on Behavioural Intention

H16: National IT Development has a positive significant direct effect on Actual Use

As younger people use technology more than older people (Alkhunaizan and Love, 2012), the effect of National IT Development on both Behavioural Intention and Actual Use was expected to be stronger among younger individuals. Men use technology products including mobiles more than women in developing countries (Gill et al., 2012). In addition, men are the main responsible individuals for families in the Middle East (Kirdar, 2010) and they use mobile phones more than women, as gender gaps in mobile phone adoption and use exist. In addition, a lower number of women work in Arab countries in comparison to other countries (Elborgh-Woytek et al., 2013). Therefore, the effect of National IT Development was expected to be stronger among men. Thus, it was hypothesised that:

H15a. Age and gender moderate the effect of National IT Development on Behavioural Intention such that this effect is stronger among younger individual and men.

H16a. Age and gender moderate the effect of National IT Development on Actual Usage such that this effect is stronger among younger individuals and men.

4.4 Defining Measurements for the Study Variables

The measurements for the constructs were adopted from different sources, mainly Venkatesh et al. (2003) and Venkatesh et al. (2012). Some adjustments and additional items were added in order to specifically fit the case of the adoption of the new generation of mobile phones, smartphones, in Arab countries. This helped to translate the variables into observable and measurable items. Some new items related to the PV and EE constructs were added specifically for mobile applications as well as the items related to mobile phones, as the role of mobile applications cannot be neglected or even isolated when studying mobile phone adoption (Kamel and Farid, 2007), specifically the adoption of smartphones. Each item was given a number related to the construct. An example of this is the first item in EE, which is referred to as EE1. Appendix I shows the measurement items for each construct and their sources. Four of the items for **Facilitating Conditions (FC)** were adopted from Venkatesh et al. (2012). The remaining three items were added in relation to mobile applications. The items for the **Enjoyment (Enj)** and **Habit (HT)** constructs were adopted from Venkatesh et al.'s (2012) study with some adjustments in order to be applicable to the case of mobile phone adoption. The items for **Price Value (PV)** were adopted from Venkatesh et al. (2012). In addition, three new items related to mobile applications were added as the cost of obtaining mobile applications was found to be high in Arab countries in previous studies (Kamel and Farid, 2007; Alkhunaizan and Love, 2012). Therefore, this was investigated.

Three of the measured items of the **Social Influence (SI)** construct were adopted from Venkatesh et al.'s (2012) study. The new added items were related to informational social influence (internalisation) (Deutsch and Gerard, 1955) and normative social influence (identification) (Deutsch and Gerard, 1955; Venkatesh and Davis, 2000). Image was found to be part of social influence processes (Venkatesh et al., 2003). Therefore, the last item in the Social Influence construct was related to image.

The items of **Perceived Relative Advantage (usefulness) (PRA (usefulness))** were adopted from Venkatesh et al. (2012) and Moore and Benbasat (1991). The researcher selected items that apply to the case of the Arab consumer in adopting mobile phones. Three of the items were adopted from Venkatesh et al.'s (2012) study related to Performance Expectancy and an additional item from Moore and Benbasat's (1991) study (PRA5). Furthermore, item PRA4 was added, as for some people, it could be that mobile phones just help them to be connected to others.

The items for **Effort Expectancy (EE)** were adopted from Venkatesh et al. (2012). In addition, two new items were added in relation to mobile application usage. It is important to understand that ease of use of mobile services can affect mobile adoption, as they are part of the mobile phone in the case of smartphones. The role of ease of use of mobile services/applications is also important (Nysveen et al., 2005a).

Three of the items for **Behavioural Intention (BI)** were adopted from Venkatesh et al. (2012). An additional item was included to test the desire of the respondents for mobile usage.

The measures of **Actual Usage (USE)** were adopted from Venkatesh et al.'s (2012) study by using both variety and frequency of mobile phone use. New options were added to apply to the smartphone handset as well as the different mobile applications available. The seven-point scale for the items was also adopted from Venkatesh et al.'s (2012) study, ranging from 'never' to 'many times per day'.

The items selected for **Culture-Specific Beliefs and Values (CSBV)** were originally adopted from Straub et al. (2001). However, they were modified to fit the face-to-face vs. technology-mediated meetings and mobile phone adoption case. The last item was to identify whether respondents actually prefer technology-mediated meetings rather than face-to-face meetings. The researcher applied the measurement items in Straub et al.'s (2001) research to study preference for face-to-face interactions vs. technology-mediated meetings in order to understand this cultural value at the individual user level.

The items selected for the **Technological Culturation (TC)** construct were adopted from Straub et al. (2001). More precisely, the items were related to informal technological culturation as it is applicable to users in Arab countries. The items were adopted from Straub et al.'s. (2001) study asking respondents about how the extent of travel for business and pleasure, having close contacts with family members residing abroad and reading foreign technology journals can be important for the use of technology. One item was developed by the researcher, which was related to the training provided by foreign companies in the country and how helpful it is for using technology.

The items of the **National IT Development (ND)** construct were adopted from those in Loch et al.'s (2003) study related to national IT policies and infrastructure. Most items were found to be applicable to the context of the National IT Development construct in this study. They were included with no modifications. The item software piracy enforcement was eliminated as it was not thought of as relevant to mobile phone adoption from the consumer's side. The item "Government IT initiatives" (Loch et al., 2003, p.46) was adjusted to fit specifically government IT initiatives of policymaking. The last item (ND6) was also based on Loch et al.'s (2003) study with some modifications to test restrictions on mobile applications.

4.5 Conclusion

This chapter was based on the first three main areas investigated in the extensive literature review undertaken for this study. An initial research framework (based on the literature review in Chapters Two and Three) was created. This conceptual framework adds value to the field of technology adoption and use in Arab countries as it drew from well-established technology adoption literature.

This research contributes to the existing body of literature by extending UTAUT2 (Venkatesh et al., 2012) by incorporating factors related to Arab culture and mobile phone adoption and a factor related to the national IT infrastructures in these countries.

The next chapter is the research methodology chapter, including the empirical work and showing how the conceptual framework acts as a link between the research questions and the questionnaire questions distributed in three countries, by including empirical data collected specifically for the purpose of this research.

Chapter Five: Research Methodology

5.1 Introduction

This chapter converts the research framework developed in Chapter Four into a number of issues that constitute the empirical work. As this research studies the complex effects of different factors on Behavioural Intention towards mobile phone adoption in a wide geographical area, using a suitable methodology that helps in exploring the effect of these factors in a wide geographical area is essential.

5.2 Research Objectives

The research started with four main objectives:

1. To examine the viability of the UTAUT2 model and extend it within the context of mobile phone adoption and use in Arab countries, namely Iraq, Jordan and UAE.
2. To analyse the factors that affect young Arabs' mobile phone adoption and use in Arab countries, namely Iraq, Jordan and UAE.
3. To examine young Arab customers' perceptions of the obstacles facing mobile phone adoption and use in Iraq, Jordan and UAE.
4. To provide insights into future trends in mobile phone adoption and use for companies currently investing or willing to invest in technology in these countries.

This research had a theoretical underpinning from three literature stems including existing technology adoption theories (Chapter Two), mobile phone adoption and use studies in Arab countries (Chapter Three) and mobile phone adoption and use in the three studied countries (Chapter Three). Accordingly, the theoretical underpinnings provided a deductive start to this research by constituting the constructs of technology (mobile phone) adoption by customers in Arab countries based on the existing literature which formed the primary conceptual framework (in Chapter Four) used in this research. This approach depends on using methods that include quantitative analysis of the collected data in order to reach highly reliable and generalisable conclusions.

5.3 Philosophical Underpinning

5.3.1 Epistemology

The three main concepts related to epistemology are interpretivism, realism and positivism (Saunders et al., 2007). Interpretive research is flexible and researchers who adopt interpretivism are open to socially constructed interpretations. One shortcoming of the positivist approach which interpretivists claim that they are able to address is the lack of social interpretations related to human interactions. Interpretivist researchers believe that fixed research based on objectivity is not able to understand human behaviour and the reasons behind this behaviour. The second branch of epistemology is realism, which is similar to positivism as it believes in the scientific approach to research. However, realism comes in two forms. First, direct realism, which is based directly on accurate reality and what truly is observed (Saunders et al., 2007). Second, critical realism which claims that the truth needs to be comprehended indirectly from reality. Bryman and Bell (2011) stated that it is sometimes difficult to distinguish between positivism and realism. In positivism, the researcher remains detached from the research participants, without being emotionally involved, to distinguish science from personal experience. Objectivity is an aim for positivist researchers as well as logical approaches (Carson et al., 2001). Positivist researchers rely on statistical techniques as a method of statistical research based on objectivism to make questions based on their findings (Carson et al., 2001). Research based on positivism has to be based on scientific knowledge (Collis and Hussey, 2014). The main disadvantages of positivism are that it is not flexible and it hinders the researcher from completely understanding social processes rather than just explaining them. Positivism is based on hypothesis testing and objective, quantitative data which allow the results to be generalised (Collis and Hussey, 2014). Collis and Hussey (2014) distinguished between the two paradigms, positivism and interpretivism. This is illustrated in the table in Appendix G.

The field of technology adoption is well defined and considered one of the most mature areas in IS research. A number of models and theories have already been developed and validated for examining the adoption of different technologies. In addition, a high number of constructs (dependent and independent variables) have been developed in the previous literature to examine the adoption of new technologies (as found in Chapter Two). This research aimed at explaining human behaviour using existing theories based on objectivity. The critical review of the literature conducted in Chapters Two and Three also showed that the dominant theoretical drive of the previous technology adoption literature is positivism. This is supported by the study conducted by Choudrie and Dwivedi (2005) which analysed 633 technology adoption articles. The conclusion was that positivism is mainly used to study the adoption of technology by individual users. This is conducted via the use of questionnaires (surveys), specifically for studying individual users' technology acceptance. Positivism is also suitable for studying culture for cross-cultural research (Straub et al., 2002). Straub et al. (2005) stated that using quantitative data is dominant and significant in IS research. They also stated that researchers can use the literature or obtain data via interviews as a first stage.[10] However, the end goal is to generate meanings based on quantitative data.

Therefore, this study adopted the positivist approach. This does not imply that using the positivist quantitative approach is the only way to conduct this research. This approach has its own limitations, as stated by Straub et al. (2005). However, it is the most suitable way to conduct the research and successfully achieve the research aim and objectives. The main aim of this research was to propose a conceptual model that includes the factors that can predict Behavioural Intention and Actual Use of mobile phones by young Arabs in Arab countries. Accordingly, a conceptual framework was developed (including the independent and dependent variables and their relationships along with the moderating variables) based on the extensive analysis of the extant literature. A significant amount of literature and theories are already available in the area of technology acceptance and usage (although not specifically related to mobile adoption in the three countries where the research was conducted) which was investigated to explore the constructs and their relationships. The deductive approach

[10] Some studies have also integrated interviews as part of their primary data collection, for example; Straub et al. (2001) where focus groups were used to inform the questions included in the questionnaire and Loch et al. (2003) who collected qualitative data as part of their questionnaire. Nevertheless, questionnaires still formed a major part of the data collection methods used in these studies.

undertaken as well as the quantitative research method (questionnaire) used were consistent with the positivist concept undertaken in this research.

5.3.2 Ontology

Ontology has three main aspects: objectivism, subjectivism and pragmatism. Subjectivism relies on the perceptions and sequent actions of participants (Saunders et al., 2007) and it is mainly related to qualitative research (Bahari, 2010). Pragmatism is usually used in mixed methods research where the researcher plays a substantial part in the research process based on their own values, away from reality. In contrast, in correlational studies, although the researcher collects data and distributes questionnaires, they have a minimum level of involvement (Sekaran, 2003). Objectivism is a branch of ontology which assumes that social phenomenon actions are separate from social actors. Sekaran (2003, p.25) stated “the more objective the interpretation of the data, the more specific the research investigation becomes”. Objectivity flows from the positivist approach.

This research followed the objectivist approach. The findings were extracted from actual data rather than the researcher’s personal assumptions. In this research, if a hypothesis is not supported, assumptions cannot be made and the researcher does not continue to argue that it exists. Furthermore, this study is of a correlational design and conducted with a minimum level of intervention from the researcher. Consequently, the researcher followed the objectivist approach which was appropriate for this research.

5.4 Research Paradigm

The two main research paradigms related to research are the deductive and inductive approaches (Collis and Hussey, 2014). Bryman and Bell (2011) distinguished between the two paradigms. While the deductive approach to research is related to theory testing and confirming and generalising facts which are already known, the inductive approach is based on theory generating/building (Bryman and Bell, 2011).

This research adopted the deductive approach as it used what is known to create the research model and hypotheses based on it. The main constructs of the research conceptual framework were developed based on an extensive analysis of previous studies. The main purpose of this research was to test theory (UTAUT2 developed by Venkatesh et al. (2012) and the Cultural Influence Model for Information Technology Transfer (Straub et al., 2001)) within the context of mobile phone adoption, so the deductive approach was the most appropriate for this research. After testing the hypotheses in new geographical areas with different cultural and economic levels, the researcher generated new findings which contribute to knowledge. One of the main characteristics of the deductive approach undertaken in this research is that it usually follows logical steps (Bryman and Bell, 2011).

The deductive approach was generally the dominant and successfully adopted approach in previous TA studies. It was adopted in this research because the research's main aim was to test a well-structured predictive variable model for Behavioural Intention and Actual Use of mobile phone users (test theory), by testing hypothesised relationships that were established in the past (in existing theories) within the technology acceptance context in each of the countries included in the study.

Accordingly, the conceptual drive of this research was deductive in nature, which was the best way of successfully analysing the conceptual framework developed in Chapter Four.

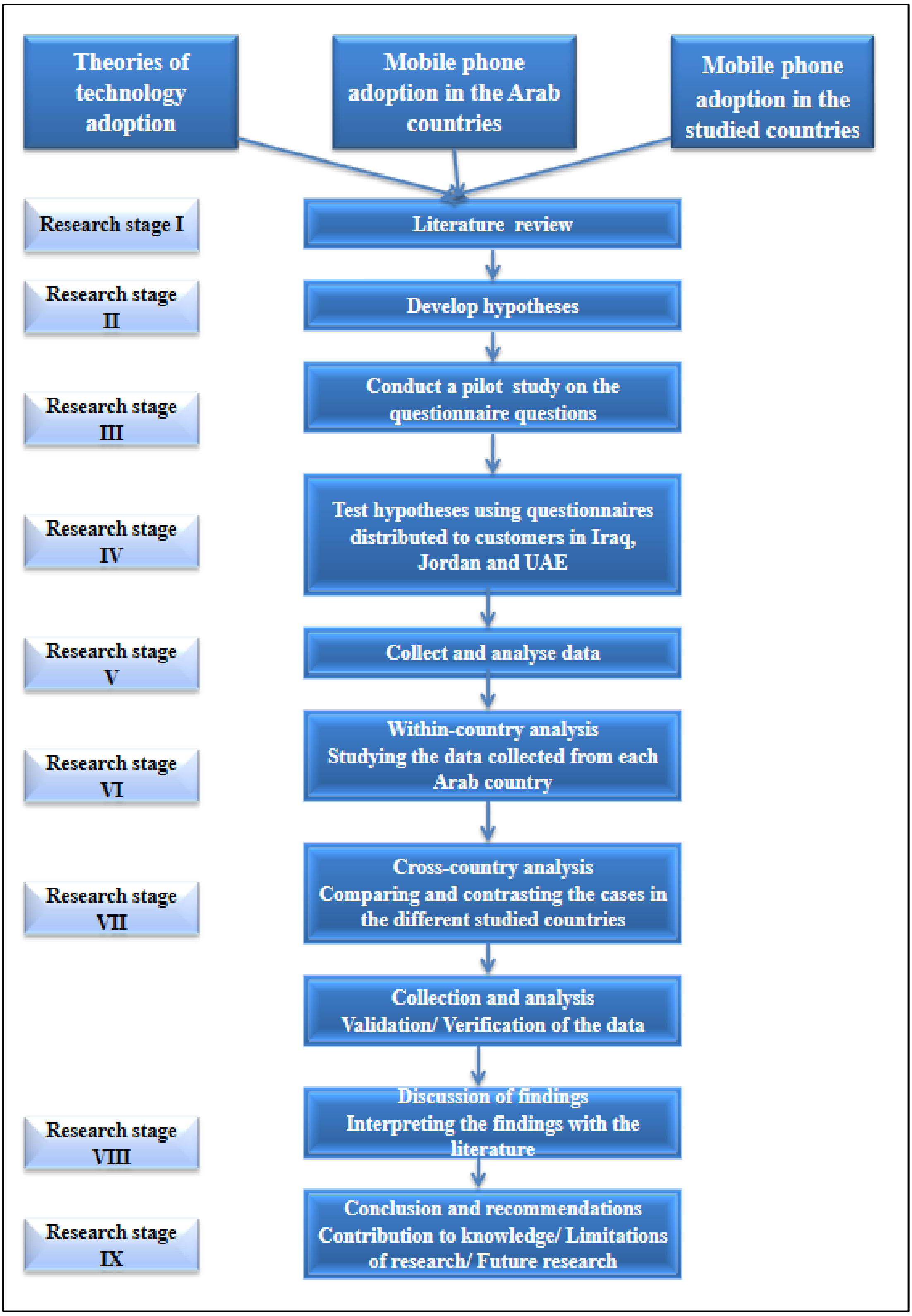
5.5 Research Design

Saunders et al. (2007) explained that the main types of research are exploratory, explanatory and descriptive. Collis and Hussey (2014) stated that there are different types of research which can be decided on based on whether the purpose is exploratory, descriptive or explanatory. Exploratory research is usually conducted when there is a lack of data on the topic to be investigated. Therefore, the aim would be to look for data to develop hypotheses (Collis and Hussey, 2014). Descriptive research describes the characteristics of the issue under investigation. It extends the knowledge gained from exploratory research (Collis and Hussey, 2014). Explanatory research further extends descriptive research.

Sekaran (2003) stated that the nature of a study can be exploratory, descriptive or hypothesis testing. Its nature depends on how advanced the knowledge on the topic of the research is, from exploratory to descriptive then hypothesis testing. Sekaran (2003, p.124) explained that "Studies that engage in hypotheses testing usually explain the nature of certain relationships, or establish the differences among groups or the independence of two or more factors in a situation". Hypothesis testing is usually followed when the aim of the research is to explain the variance in the dependent variable (Sekaran, 2003). The literature review conducted in Chapters Two and Three showed that the knowledge on technology adoption is mature and advanced and the conceptual framework was developed based on this literature. The conceptual framework included a number of predictors (independent variables) that can predict the dependent variables and explain the variance in them via a set of hypotheses developed in Chapter Four. Accordingly, this study was conducted for the purpose of hypothesis testing to explain the relationships in the model and identify the differences between groups. In addition, in contrast to exploratory research, this research is confirmatory in nature.

The following flowchart (Figure 5-1) illustrates the research design and the steps undertaken in this research.

Figure 5-1: Research Design



Source: Created by the author

5.6 Correlational Research Design

Correlational research design is based on the assumption that relationships exist between everything in the world (Davis, 1989). It is based on measuring variables in relationship to others. Correlational research design is concerned with testing relationships between variables (Sekaran, 2003), which is the case with this research. Correlational research design is also used to determine changes in behaviour (Privitera, 2014). The correlational coefficient is used to identify the level up to which two variables are correlated (Privitera, 2014). The correlation coefficient ranges from -1.0 to +1.0 and these two values are used to determine the direction and strength of the relationship between two factors (Privitera, 2014). In this research, various statistical techniques related to the correlational research design were used. The use of correlational research design implies the use of correlational statistical techniques. These are discussed later in this chapter.

5.7 Quantitative Research Methods

The selection of the research design differs fundamentally between the three main types of research methods, including quantitative, qualitative and mixed methods (as illustrated in the table in Appendix H, adopted from Creswell (2008)). Within the context of this research, quantitative analysis can measure the effect of each of the independent factors on Behavioural Intention and Actual Usage. Using measurements in quantitative research helps to identify even small differences and variations between people (Bryman and Bell, 2011). Within the context of this research, quantitative analysis helps to identify even small differences between people in terms of mobile phone adoption and their views of the factors affecting it. The measurements in quantitative analysis provide more precise estimates of the relationships between the variables in the conceptual framework. The selected methodology allowed the researcher to meet the basic requirement of this research: testing relationships between different existing variables in a large population.

The selection of the type of research methods to be used is closely associated with the selection of research design and methodology. Choudrie and Dwivedi (2005) found that the survey method has been the most widely used method in technology adoption studies. It has also been the most widely used research method in IS research (Palvia et al., 2004; Palvia et al., 2007). The use of surveys provides research with external validity. Furthermore, it provides the opportunity to generalise the findings of the research. The topic of IS usage (e.g., TAM by Davis (1989)) has been widely researched (Palvia et al., 2007). On the other hand, surveys have their own shortcomings; for example, they “suffer from worldly richness, lack of control and low internal validity” (Palvia et al., 2007, p.7). However, the authors contended that for studying technology adoption among individual users, the survey is the appropriate research method.

In order to obtain an overall picture of the research topic to be investigated, data must be collected from a large number of customers. The survey method is the most widely used research method in IS research (Straub et al., 2005). In addition, surveys are suitable for conducting research in large populations (Nachmias and Nachmias, 2008). Accordingly, quantitative methods (surveys) were used in this research. Using quantitative data provided the research with both external validity and the possibility of generalisation. Munđar et al. (2012) found that quantitative research methods (surveys) are increasingly used in studies related to information technologies. Venkatesh et al. (2013) stated that when testing a model which has already been developed in a similar context, there is no need to change the research method that was originally used in that research. The main research method used in the key studies related to this research (which the conceptual framework was based on) including Venkatesh et al. (2012) and Straub et al. (2001) was surveys which were used to test their models. Straub et al. (2001) and Loch et al. (2003) also collected qualitative data as part of their studies when gathering data from Arab users to validate the constructs in their models for those users. Loch et al. (2003) collected qualitative, as well as quantitative data, via the distribution of the questionnaire developed in their research.

The work conducted by Straub et al. (2001) and Loch et al. (2003) already included qualitative data which informed this research. The technology used for testing UTAUT2 was mobile Internet and data were collected from consumers in Hong Kong-China. Therefore, testing UTAUT2, which was developed for a similar technology and within a similar context (i.e., consumers in a developing country) using a quantitative method (questionnaire), as used by Venkatesh et al. (2012), is applicable for this study. The majority of TA studies analysed in the literature review (Chapters Two and Three) used questionnaires (e.g., Davis, 1989, Taylor and Todd, 1995b; 1995c; Malhotra and Galletta, 1999; Venkatesh et al., 2003; Park and Chen, 2007; Meso and Musa, 2008; Park et al., 2009; Khraim et al., 2011; Akour and Dwairi, 2011; Elbadrawy and Aziz, 2011; Khayyat and Heshmati, 2012; Alkhunaizan and Love, 2013). This includes studies related to testing and developing UTAUT in Arab countries, as shown in Appendix A. A five-point Likert scale was used in some studies (e.g., Park and Chen, 2007; Akour and Dwairi, 2011; Alkhunaizan and Love, 2012; Jaradat and Al-Rababa, 2013). A seven-point Likert scale was also used in previous TA studies (e.g., Malhotra and Galletta, 1999; Kwon and Chidambaram, 2000; Al-Gahtani et al., 2007). The Likert scale provides measurements in a list which makes it easy to fill in and less time-consuming for the respondents (Bertram, 2010; Collis and Hussey, 2014). The use of a seven-point Likert scale (as a minimum) was recommended by Foddy (1994) as it increases the validity and reliability of the scale. Based on this recommendation and the extensive use of the seven-point Likert scale in previous studies including Davis (1989), Venkatesh et al. (2003) and Venkatesh et al. (2012), a seven-point Likert scale was used in this research.

According to the research of Lee et al. (2013), most research on the effect of culture on technology adoption has used the survey method. It can be argued that it is be better to study culture in relation to technology using interviews (qualitative data). However, previous studies used questionnaires to study culture in relation to IT and mobile phones (e.g., Straub et al., 2001; Loch et al., 2003; Frigui et al., 2013). Straub et al. (2002) recommended using a positivist approach using quantitative methods for studying culture in relation to IS, based on the argument that culture is not country-specific but rather specific to each individual. Questionnaires for studying the effect of culture on technology acceptance were used in previous studies (e.g., Srite and Karahanna, 2006) and recommended by researchers (e.g., Straub et al., 2002). This research was consistent with the mind-set of these studies. Therefore, the use of quantitative data to study the effect of culture on TA was found to be an option that can successfully bring significant results in this research.

To summarise, the main reasons for choosing a survey as the selected research method in this research include:

1. The use of questionnaires allows the researcher to apply correlational statistical techniques to test the relationships between the variables (including cultural-related variables) in the conceptual framework developed in this research.
2. The quantitative method (questionnaire) is the most widely used research method in previous TA-related studies which makes it a valid method to use in this research and is consistent with the studies the conceptual framework in this research was based on. Furthermore, quantitative data collected via questionnaires was the most widely adopted approach among studies conducted in Arab countries concerning ICT adoption (Halaweh, 2015).
3. Cross-sectional survey methods with Structural Equation Modelling (SEM) was the dominant approach in testing UTAUT in previous studies (Williams et al., 2015). Hence, the methods adopted in this research are consistent with previous work concerning UTAUT.
4. The use of questionnaires in this research provides external conclusion validity, which is important for the purpose of this research.
5. The research covers a large geographical area (urban areas in three Arab countries). Hence, the use of questionnaires in this research provides an increased opportunity to generalise the research findings, which is also important for the specific purpose of this research. Furthermore, the use of quantitative data collected through the survey allowed an accurate comparison between the data collected in the three countries (i.e., group comparison).

6. The use of questionnaires for collecting quantitative data is consistent with the positivist paradigm and the deductive approach followed in this research.

Sekaran (2003) listed the advantages and disadvantages of different types of interview and questionnaire. Based on this, it can be argued that personally administered questionnaires have a significantly higher response rate in comparison to mail questionnaires and electronic questionnaires. Moreover, ensuring the privacy of respondents is firmer in personal administered questionnaires and it helps to provide more robust data (Sekaran, 2003). The author of this research considered the possibility of administering the questionnaires electronically where respondents can complete the questionnaires online via their computers. This would have been less time-consuming and less costly, too, especially since the research covers three countries. However, in order for a respondent to complete an electronic questionnaire, they must have access to a computer (the adoption level of which is significantly lower than mobile phone adoption in Arab countries) and be willing to complete the questionnaire online. If the questionnaire was distributed and completed via the Internet or social media, all participants would have been highly familiar with technology, which would not have provided a clear image of the situation, and the response rate would have been lower. Moreover, the researcher did not have a list of the email addresses of the targeted respondents to distribute the questionnaire via email. Distributing the questionnaire face-to-face ensures obtaining higher quality data (Collis and Hussey, 2014). Therefore, a field study was selected as the most appropriate choice to collect data from participants. Conducting a field study helped the researcher to be confident with the data collected from respondents and ensure that they were not biased. This was a major factor in ensuring the reliability and validity of the research findings.

This research adopted a cross-sectional design (Bryman and Bell, 2011) as quantitative data were collected from participants in the three countries at one point in time and an examination of the relationships between variables in the conceptual framework was conducted. The questionnaire was originally written in English (see Appendix L). The first stage was to translate it to Arabic using a professional translator (see Appendix M). The second stage was to carry out a back translation, which is a good way of ensuring that the questionnaire is accurately translated (Sekaran, 2003). The final stage was to show the Arabic and English versions of the questionnaire to a second accredited translator to carry out another back translation process to ensure that it was accurately translated and to ensure both idiomatic and conceptual equivalence. In addition, the author of this research speaks and writes both languages fluently, which helped to ensure that the translated (Arabic) version which was distributed to Arab customers was accurate and tailored to meet the concepts of Arab culture. The wording and sequence of questions were shown to a number of academics at Lord Ashcroft International Business School (LAIBS) at Anglia Ruskin University and from another university to gather their opinions and some amendments were made according to their recommendations. This helped to prevent data collection errors (Bryman and Bell, 2011).

5.8 Participants

The segment (15-29 years old) (the youth segment) is the largest segment of the Arab population, as found in the literature. Previous studies have provided information about the Arab population and stated that the 15-29 years old segment is the largest in the Arab population (Hayutin, 2009; Dhillon and Yousef, 2009; Choueiki, 2010; Kronfol, 2011; GSMA, 2013, GSMA, 2014). The 2014 GSMA report stated that one out of five in the region is aged 15-24 and more than 60% of the population is less than 30 years old (GSMA, 2014). Another study, specifically focusing on social media via cell phone adoption and usage in Egypt (Kavanaugh et al., 2012) not only stated that 15-29 year olds form the largest segment of the Arab population but also they form a large segment of Internet users. The authors stated, "There is a high percentage of young people (aged 15-29) among the total population in most Middle Eastern countries, and a high proportion of Internet and social media users among young people. These two factors allow this segment of the population to draw on many online sources of information besides the more widely used mainstream media of television and newspapers" (Kavanaugh et al., 2012, p.8). In addition, young people form a large segment of the population in Iraq (UNDP, 2014a), Jordan (UNDP.org, 2013) and UAE (UNDP, 2014b).[11]

The author of this research included the 18-29 years old group only, as if participants under the age of 18 were included too, many ethical issues would have been raised since the researcher would be dealing with 15-18 year olds in three different countries who are not adults, which would have complicated the research process. The author included Arab participants aged 18-29 years old who were actually resident in the Arab countries where the research was conducted. This particular age group forms the

[11]In Iraq, 60% of the population is under the age of 25 (UNDP, 2014a). In Jordan, 70% of the population is under 30 (UNDP.org, 2013), In UAE, 51% of the population was under the age of 30 according to the last census in 2005 (United Arab Emirates National Bureau of Statistics, 2015).

early adopters of any new mobile phone in the market, for example smartphones, and are users with high potential. The reason for including only people who were actually resident in these countries was that there have been many movements in these countries; for example, the number of migrants in Dubai is high. Also, in Erbil and Amman, there has been an increase in the number of people from other countries such as Syria for political reasons. The inclusion of people who are resident in these countries helped the researcher to ensure that there was no bias in the data collected from the participants.

5.9 Reasons for Specifically Choosing the Three Arab Countries

There were two main reasons for choosing the respondents in the three Arab countries. First, they vary in terms of technology adoption; for example, in Iraq, the level of technology adoption and ICT infrastructure started to grow rapidly but is still significantly lower than the level of mobile phone adoption and ICT infrastructure in other Arab countries and UAE (Dubai) is the strongest country in terms of mobile phone adoption and penetration. This helped to understand the variations when comparing how the model fits in these countries. Second, each individual country selected for this research has characteristics that helped to obtain in-depth data in terms of the country itself. The main characteristics of each country included in the study and the reasons for selecting it are as follows:

1. Iraq: It is one of the newest growing emerging mobile markets in the Arab world and the third largest mobile market in the Arab region (GSMA, 2014). The income level varies. The country is one of the Levant countries in the Middle East. The level of mobile phone adoption is accelerating but still lower than the other countries

included in the study. In addition, mobile companies in Iraq had the highest drop in revenues in the Arab region in 2015 (GSMA, 2015b). These factors make studying mobile phone adoption in this country crucial. In addition, there is a severe lack of research on technology adoption in general and mobile phone adoption in particular in Iraq in comparison to the rest of the Arab countries, which made conducting research there a necessity to address the gap in knowledge about mobile phone adoption and the issues related to it in this country. It is also one of the least developed countries in terms of ICT infrastructure in comparison to the other Arab countries (GSMA, 2015b), which help the comparison between it and other more advanced Arab countries in terms of mobile phone adoption and understanding the individual young Arab's needs bring clearer and more accurate results.

2. Jordan: It is in the middle in terms of the level of technology adoption compared to other Arab countries. The use of technology in education is higher than other countries. Its mobile penetration growth level is high (exceeds 100%) and the ICT sector is more liberalised (Khraim et al., 2011; Hakim and Neaime, 2014). Nevertheless, the country had issues in terms of taxation policies of mobile phone use and its impact on pricing, and mobile operators have experienced a decline in revenues (GSMA, 2015a). It is also one of the Levant countries in the Middle East. Jordan is ranked high in terms of mobile phone adoption and penetration level, although the income level is low to middle (GSMA, 2015a). In terms of technological infrastructure, Jordan is in the middle (between Iraq and UAE). These characteristics made the inclusion of Jordan appropriate for the purpose of this research.

3. UAE: It is the most advanced Arab country in terms of mobile phone adoption and penetration and ICT infrastructure (GSMA, 2015b). In fact, it is the country with the highest mobile adoption level and smartphone penetration in the world (GSMA, 2015b). Also, the country has a high GDP per capita, which the literature suggests affects mobile phone adoption. Studying the situation in this country was important for the study for the purpose of comparison and finding a model that fits in different Arab countries. UAE is one of the Arab Gulf countries, which are considered significantly more advanced than the rest of the Arab region (GSMA, 2015b). The inclusion of UAE as one of the most advanced countries in terms of mobile phone adoption and penetration rate in the Arab region and the highest in smartphone penetration rate in the world helped to clearly distinguish the differences in the effect of the factors on BI and USE in the proposed model between the less advanced and the highly advanced Arab countries.

Including the above three Arab countries allowed the researcher to investigate how the model developed in this study fits in different geographical areas (countries).

5.10 Sampling

Bryman and Bell (2011) distinguished between probability and non-probability sampling. The main advantage of using probability sampling is that the researcher can make inferences from a random sample to the selected population. Therefore, the possibility of generalisation is high (Sekaran, 2003). In contrast, in non-probability sampling, the researcher selects respondents to participate in the research. However, the possibility of generalisation in this case is fairly low (Sekaran, 2003). This research adopted probability sampling by using multistage cluster sampling. Multistage cluster sampling is useful for the case of this research since the research covered a wide geographical area. Multistage cluster sampling is suitable for research taking place in large geographical areas (Bryman and Bell, 2011). It is common for research carried out in developing countries (Yansaneh, 2005). Area sampling is an example of multistage cluster sampling (Sekaran, 2003; Valliant et al., 2013). Valliant et al. (2013) explained that there are situations in which the use of multistage cluster sampling (area sampling) is selected as the appropriate sampling method. The use of this sampling technique is appropriate when there is no list of the target units available to the researcher. In addition, Valliant et al. (2013) explained that when the research takes place in households and data are collected in person by the researcher, area sampling becomes highly applicable. This sampling method is more representative than convenience sampling which has been used in previous studies conducted in Arab countries (e.g., Al-Qeisi, 2009; Khraim et al., 2011; Tarhini et al., 2015; Baabdulla et al., 2015). Using the multistage cluster sampling technique was particularly useful in the case of this research for the following reasons:

1. It helped to reduce the sampling complications as the study covered large populations.
2. There is no complete accurate data available regarding the entire population and the number of households in each district and subdistrict (no accurate sampling frame).
3. There is no accurate postcode system similar to developed countries in order to obtain information about the age range of individuals living in certain households (e.g., Census) in order to have an accurate sampling frame of people aged 18-29 years old.
4. The population of each of the cities and districts in each of these countries tends to be different from the others (heterogeneous). However, the population within each

district has certain characteristics which makes it homogeneous up to a certain level in terms of income and education level.

5. Using this particular sampling technique helped the researcher to identify where the respondents came from.

The researcher ensured that all measures took place in order for the selected sample to be representative of young people residing in the major city of each of the three countries The face-to-face distribution of the questionnaire and inclusion of different areas (districts) with different economic and educational levels significantly helped towards achieving this goal.

Bryman and Bell (2011) explained that multistage cluster sampling is more concentrated than simple random sampling or stratified sampling. Multistage cluster sampling is suitable for quantitative research (surveys) carried out in a large geographical area where a simple random selection of the population is not possible and could be less representative (Bennett et al., 1991). However, sampling error cannot be avoided, even with this type of sampling technique (Bryman and Bell, 2011). In fact, sampling error occurs at each stage of the multistage cluster sampling technique (Babbie, 2009). However, sampling error can be reduced by increasing the sample size or increasing homogeneity of the elements (Babbie, 2009). The level of homogeneity is balanced, which helped to give a representative sample with the balanced sampling error. The participants residing in the different districts in each major city were different in terms of income and education level which helped to obtain a representative sample of each major city. However, participants in one district can have a certain level of homogeneity in terms of income and education levels.

Although the multistage cluster sampling technique is useful and it was found appropriate for the purpose of this research, this technique has its own shortcomings which must be addressed. This sampling technique relies heavily on extensive information about the different units at each stage and contains some sampling bias (Watt and Berg, 2002). In multistage cluster sampling techniques, sampling must be carried out with probability proportional to size (PPS).[12] This is especially the case in developing countries where the population of different areas is highly varied for several reasons (Yansaneh, 2005). For each selected area, having a probability proportional to its size ensures an increased precision of survey estimates (Yansaneh, 2005). Another potential problem with the sampling frame is blanks (Yansaneh, 2005). In the case of this research, identifying households that have the target respondents (i.e., aged 18-29 years old) was a challenge as, although the youth segment of the population in each of the three countries is large, not all households have people within this age group. As the required sample size must be reached, when a household did not include participants with the targeted age range, the researcher reached another household. On the other hand, another potential problem with the sample of a household survey frame is the possibility of having households with more than one person aged 18-29 years. As randomly choosing one respondent from a household with more than one person aged 18-29 years old leads to unequal probabilities of

[12]The researcher followed the PPS method proposed by Bennett et al. (1991) when selecting the districts to be included in each selected city. This method is carried out using a table in which each district is assigned a number in the first column, its population size in the second column and the comulative population size in the third column. The researcher started by dividing the total population size in all districts by the number of districts to be selected (three) then chose a random number between one and the result of this division. This number was fitted into a position in the list (table) to identify the first district. The sampling interval was added to the random number which was originally selected to choose the second district and the same process was repeated to select the third district.

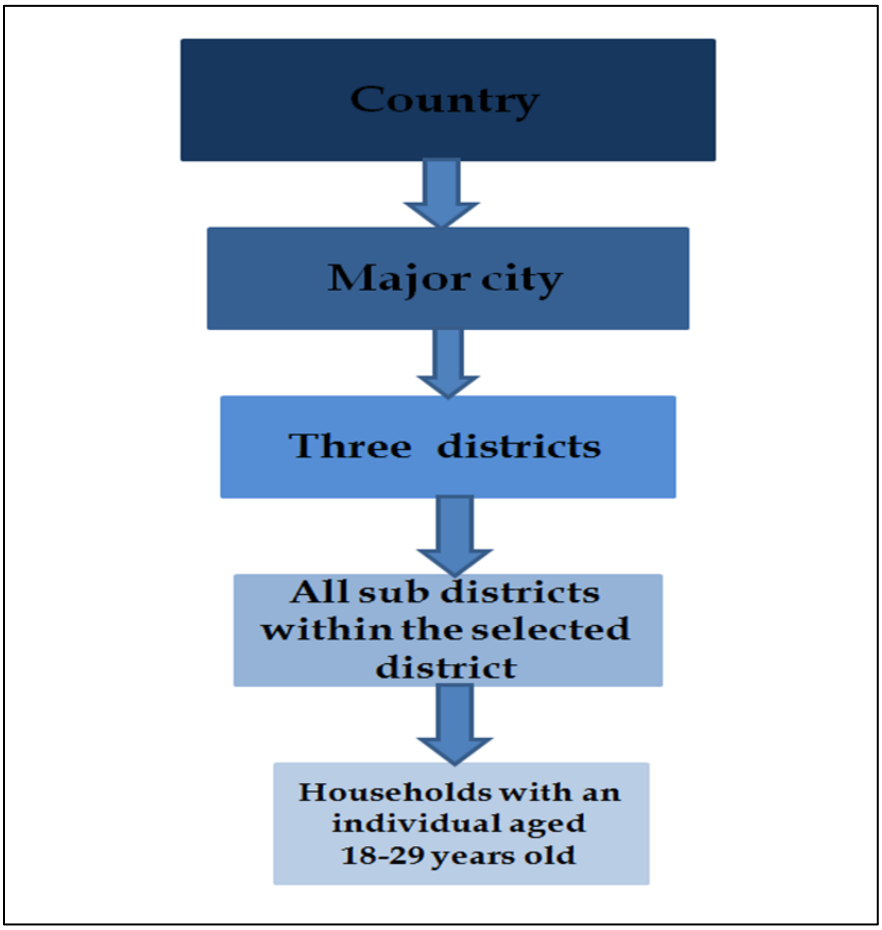
selection, using one questionnaire per household was recommended (Glewwe, 2005). The researcher distributed the questionnaire to only one individual aged 18-29 years in each household.

Multistage cluster sampling took place in a number of stages based on the geographical units (as shown in Figure 5-2). The first stage was selecting three Arab countries (Iraq, Jordan and UAE). The research took place in each country in urban areas, major cities including Amman (Jordan), Dubai (UAE), Erbil (Kurdistan, Iraq). This was the second stage. The third stage was to select three districts in each of the major cities randomly through a table of listed numbers using the probability proportional to size method. In the fourth stage, all subdistricts within each selected district in the three major cities were included to distribute the questionnaires in. The fifth and final stage was to randomly select households with an individual aged 18-29 years from all subdistricts included in the study (one individual aged 18-29 years from each household).

When a household had more than one individual within the targeted age group, only one individual aged 18-29 years was selected. This helped to ensure that the respondents had different characteristics and reduce bias, as individuals living in the same households are likely to have similar responses. This also helped the researcher to distribute the questionnaire in all the targeted subdistricts. This stage, in particular, was difficult, as the researcher was unable to obtain any official data about individuals living in households in the districts in any of the three countries in order to know where 18-29 years olds were located.

Unfortunately, no accurate data or a postcode system, district or subdistrict data were available regarding the proportion of individuals aged 18-29 years old in the three cities. This prevented the researcher from obtaining a more representative sample in terms of the number of people within the targeted age group. Therefore, the researcher selected households randomly, starting from the centre of each district, as recommended by Bennett et al. (1991). The researcher then chose the direction randomly and asked people in each household whether they had someone aged 18-29 years prior to giving them the questionnaire face-to-face.

Figure 5-2: Process of Selecting Samples using Multistage Cluster Sampling



Source: Author's own

As shown in Figure 5-2, the multistage cluster sampling (area sampling) was conducted using the following stages:

Stage One: Three Arab countries were selected: Iraq, Jordan and UAE

Stage Two: A major city in each country was selected as an urban area.

Stage Three: Three districts from each selected city were selected randomly.

Stage Four: All subdistricts of each district were included.

Stage Five: Households with an individual aged 18-29 years were randomly selected in each subdistrict.

5.10.1 Sample Size

There has been a debate in the existing body of literature with regards to deciding the suitable sample size. Unlike Covariance-Based Structural Equation Modelling (CB-SEM), Partial Least Squares-Structural Equation Modelling (PLS-SEM) has high statistical power when the sample size is small (Hair et al., 2014). Barclay et al. (1995) suggested that the ideal sample size for PLS-SEM can be calculated using either ten times the largest number of the formative indicators of a construct or ten times the structural paths heading towards a construct in the model (whichever is larger).

Based on this rule of thumb and taking the larger option into consideration, the minimum sample size required for each country included in this study is 100, as there are ten structural paths heading towards the construct ‘Behavioural Intention’ (10x10=100). Henseler et al. (2009) stated that when researchers have small sample sizes, they tend to prefer PLS-SEM to CB-SEM. However, the statistical significance detected by PLS-SEM becomes severely affected when the sample size is too small. Henseler et al. (2009) illustrated that the effect size (the desired level of power) is more important than the ten times rule of thumb. Although the above illustrates that

PLS-SEM possibly has no ability in dealing with small sample sizes, it still has the power to deal with complex models with sample sizes that are too small to be handled by CB-SEM. The major rule of thumb as recommended by Henseler et al. (2009) is that researchers should decide on the sample size that should be sufficient to support their conclusions. Hair et al. (2014) recommended that the sample size should be determined by means of power. They also stated that when the sample size exceeds ($N=250^{+}$), the results in both CB-SEM and PLS-SEM become similar when the number of indicators for each construct is consistent. Another way to decide the sample size is to consider the data analysis plan and techniques used (Fowler, 2002). Roscoe (1975) suggested that a sample size between 30 and 500 is sufficient for a research study. However, in general, a minimum sample size of 200 is required to provide sufficient statistical power (Kline, 2005; Sharma et al., 2005).

As the population of the research is heterogeneous, the sample size needed to be large (Bryman and Bell, 2011). This research took place in three Arab countries with high populations. This meant that every mobile user in these three countries was a potential participant in this research. This could not be reached as it was not manageable especially with face-to-face distribution. As multistage cluster sampling (area sampling) was used, the researcher decided to select participants in urban areas, more precisely from selected areas in the major city of each country. There was a lack of up-to-date and accurate census data based on which the researcher could have drawn the sample size.

One of the main problems in conducting multistage cluster sampling in developing countries is non-coverage of the sampling frame. The target population of this research was people aged 18-29 years in households in each of the major cities in the three countries. An additional indicator for the case of Iraq-Kurdistan was Arabic language fluency.[13] The sampling frame in multistage cluster sampling should be specific and accurate. However, the total number of households with a person aged 18-29 years (and speaking Arabic in the case of Erbil) was not available in Erbil and Amman. Therefore, the researcher had to encounter the entire population of each city which the districts were selected from. The entire population of the city was the sampling frame based on which the sample size was calculated. Moreover, the questionnaires were distributed face-to-face. Therefore, the main consideration for calculating the sample size in this research was to be statistically acceptable in addition to being representative enough. A sample of 400 questionnaires satisfied the needs of PLS as well as the sample size required from each country based on the formula used. The total population of each selected city of each country can be found in Table 5-1 below:

Table 5-1: Population of the Selected City in each of the Three Countries

Country	**City**	**Total population of the city**
Iraq (Kurdistan)	Erbil	1,749,900
UAE	Dubai	2,213,845
Jordan	Amman	2,528,500

Source: Adapted from: www.citypopulation.de, 2014; Dubai Statistics Centre, 2014; Department of Statistics Jordan, 2013

[13]The author of this research speaks, reads and writes Arabic fluently. This enabled the researcher to approach the respondents to check that the participants actually spoke, read and wrote Arabic fluently before handing them the questionnaire.

The formula used to calculate the sample size for each country was Yamane's (1967, p.886) formula:

$$n = \frac{N}{1 + N * (e)^2}$$

where:

n is the sample size

N is the population size

e is the precision level (in this case 5% (0.05))

Confidence interval 95%

When calculating the sample size, researchers must consider the issue of non-response rate (Bryman and Bell, 2011). In general, the minimum response rate should be 75% (Fowler, 2002). Therefore, an additional 25% was added to the calculated sample size in each country. The sample size selected in each country based on Yamane's (1967) formula was 400 with an additional 25%. Therefore, the sample size from each country was 533 questionnaires (see Appendix K for more information on how the sample was selected and the population of each selected district and its subdistricts). The sample size from each of the three countries was considered appropriate when compared to the sample sizes used in previous studies concerning UTAUT (examples of these are the previous studies analysed in Dwivedi et al. (2011) and Williams et al.'s (2015) studies).

Yansaneh (2005) stated that in the case of survey-based research in developing countries, some regions of a country are excluded due to local conditions (such as war). Due to the severe political situation in the southern part of Iraq at the time this study was carried out (especially in the capital city, Baghdad), the researcher could not obtain data from this part of Iraq for safety reasons. An alternative solution was to obtain data from the northern part (Kurdistan) which was the only safe part of the country during the period of this study. However, another problem was highlighted, which was the language barrier, as the questionnaire was translated into Arabic for participants in the other two countries included in the study. There are two official languages in Iraq (Arabic and Kurdish). Arabic is spoken and understood by a high number of residents of this region. However, after consulting many colleagues and academics residing in this region, the researcher found that a high number of people from the south (Arabs) reside in Kurdistan and only use Arabic for speaking, reading and writing. The three selected districts in Erbil were Shaqlawa, Erbil City and Koya. The selected districts in Amman were Amman Qasabat, Marka and Wadi Essier. In UAE, the selected communities in Dubai were Al-Twar, Jumeirah and Al-Barshaa. The questionnaires were distributed to individuals aged 18-29 years in all subdistricts/subcommunities in the selected districts/communities in the three countries. A total of 1,264 completed questionnaires (398 from Iraq, 429 from Jordan and 437 from the UAE) were included in the analysis. The response rate was 75% in Iraq, 80% in Jordan and 82% in UAE. These response rates are slightly higher than the response rates in other studies that tested UTAUT and UTAUT2 in Arab countries and distributed questionnaires face-to-face, for example; the response rate in Al-Imarah et al.'s (2013) study in Iraq was 71.6%, the response rate in Alshehri et al.'s

(2013) study in Saudi Arabia was 80%, the response rate in Alalwan et al.'s (2014) study in Jordan was 75%, the response rate in Masa'deh et al.'s (2016) study in Lebanon was 75.4%. The face-to-face distribution of the questionnaires helped to reach high response rates.

The minimum required number of questionnaires was 400. To ensure that this minimum number is reached, an additional 25% was added. Therefore, a total of 533 questionnaires were distributed in each of the three countries. The number of questionnaires included in the analysis was 398 in Iraq, 429 in Jordan and 437 in UAE. Although the sample size is considered high, it is compatible with what was used in extant literature that tested the UTAUT and the UTAUT2 in Arab countries to study the adoption of different technologies; for example, the sample size in Abu Shanab et al.'s (2010) study was 523 questionnaires, Alkhunaizan and Love's (2012) study was 574 questionnaires, AlOtaibi's (2013) study was 442 questionnaires, AlImarah et al.'s (2013) study was 430 questionnaires, Alshehri et al.'s (2013) study was 400 questionnaires; Alalwan et al.'s (2014) study was 348 questionnaires; Baabdullah et al.'s (2015) study was 418 questionnaires, Masa'deh et al.'s (2016) study was 359 questionnaires and Badwelan et al.'s (2016) study was 401 questionnaires. Also, the research covered a large geographical area. Therefore, it was important to have a sufficient number of questionnaires to have a reasonably representative sample.

Although having a sufficient sample size is important, the focus of the researcher was allocated to the explanatory power of the questionnaire and the quality of the questions included in it. The majority of the questions were adopted from previous literature with minor modifications to fit the context of this research. The questions included in the questionnaire were targeted towards achieving the aim and objectives of this research. The questions asked in Sections one, two and three in the questionnaire allowed the researcher to accurately assess whether the proposed model which was based on an extension of the UTAUT2 fits well in the three countries included in the study. This helped to achieve objectives one and two of this research. In addition, Section four included questions on important issues which are directly linked to objective three. This is discussed further in the next section.

5.11 Questionnaire Development

The design of the questionnaire plays a critical role in research. The questionnaire and questions should be simple, short and pre-coded (Glewwe, 2005). The researcher ensured that the design of the questionnaire was tailored to address the main research objectives. A specific symbol was added to the questionnaires related to the country in which the questionnaires were distributed in order to differentiate between the responses from respondents in each country.

The questionnaire included five A4 pages and a covering letter (Participant Information Sheet) and the Participant Consent Form. The questionnaire included four main sections. The first part included questions about the demographic factors of the respondents. The main aim of this section was to obtain personal information including age, gender, education level, income level, language fluency (Arabic and English), employment status, whether the respondents were resident in the country where the data were collected and the length of time they had been resident.

The age group included in the study was 18-29 years old. This was broken into two groups in the questionnaire, 18-22 and 23-29. The reason was that between the ages of 18 to 22 years old, respondents were expected to be mostly university students. On the other hand, respondents between the ages of 23 to 29 years old were expected to be working and more responsible. Two additional options were included in the questionnaire in order to ensure that the respondents were within the required age range. No responses from respondents under the age of 18 years old or over the age of 29 years were taken in this study. This section also included two questions related to Technological Culturation to gather the extent to which respondents travel for business and pleasure and the extent of interaction with family members living abroad. The question asking about the extent of travel for pleasure or business included three options (whether the respondents travelled more or less than 10 times per year or if they did not travel at all). The question asking about the extent of contact with family members residing abroad was designed as a five-point Likert scale, asking the respondents about their level of agreement or disagreement with a statement that the participants maintained good contacts with family members living abroad. However, the questions about travelling for pleasure and business and being in contact with family members residing abroad were eliminated after the pilot study was conducted (see Appendix J for information on the pilot study).

The main purpose of the second section of the questionnaire was to find out whether respondents used mobile phones, and if so, what make their mobile phones were, how long they had used them and the frequency of their mobile services/application usage. This helped the researcher to understand the current level of adoption, customers' preferences for mobile applications, which mobile applications they do not use at all and their experience level.

The third section included the statements on the constructs included in the research model (Appendix L). The main aim of this section was to understand young people's adoption of mobile phones as well as predicting future usage. This section included statements with a seven-point Likert scale to choose between 1 = strongly disagree to 7 = strongly agree, as found in Venkatesh et al.'s (2012) study. Bryman and Bell (2011) recommended using questions that had been used before by previous researchers. This can provide several advantages. It provides an opportunity for comparison with the findings of studies which used the same or similar questions. It also provides the required primary information regarding the validity and reliability of the research, since it can be considered as if it has been pilot studied before. Additional items specifically related to the case of Arab users were included.

Section four of the questionnaire was added to the final questionnaire (after the pilot study was conducted) as its inclusion was advised by academics during the pilot study. This section included two questions. The first asked the respondents whether they think that there are any challenges facing mobile adoption and usage in their country. This was followed by another question to be answered by those who think that there were challenges. The question included a list of the main issues facing mobile phone adoption and usage in these countries found in the literature, including Poor ICT infrastructure, Lack of government regulations and policymaking, High prices of tariffs by the provider, High prices of mobile handsets, High prices of mobile Internet by the provider, Bad network connections, Market monopoly by the provider, Being restricted from certain mobile applications, Ethical issues or Cultural issues. The respondents were also given the option to add any other problems/challenges they could think of. The main aim of the last section was to clearly reveal the challenges facing mobile phone adoption from the users' point of view based on their experience and knowledge; in other words, to achieve the third objective in this research. The last part of the questionnaire asked the respondents to add any other comments they had on the subject.

5.12 Partial Least Squares-Structural Equation Modelling (PLS-SEM)

The data collected from each country was analysed separately first in order to test the model in each country. Then the groups were compared using statistical tests in order to accurately examine the differences and similarities between them. This enabled the researcher to examine whether it was possible to use a single model that can explain and predict mobile phone acceptance in the three studied countries. Descriptive statistics including maximum, minimum, mean, standard deviation and AVE were used for the interval-scaled independent and dependent variables (Sekaran, 2003). The first stage of analysing the collected data was to carry out descriptive statistics analysis using the Statistical Package for the Social Sciences (SPSS) IBM Statistics version 20 software. This helped to provide a first view of the data, prior to applying the more sophisticated statistical tests. The second stage was applying Partial Least Squares-Structural Equation Modelling (PLS-SEM). Structural Equation Modelling (SEM) allows the researcher to test the measurement and the structural model (Hair et al., 2006).

5.12.1 Rationale for Using Partial Least Squares-Structural Equation Modelling (PLS-SEM)

There are many methods that can be used to analyse data, for example; Multi-dimensional scaling and Dichotomous Probit Regression. Multi-dimensional scaling allows aggregating the understanding of individual sorters, in the form of similarity judgments into a dimensional map of coordinates, showing the distance between different objects under investigation (Wickelmaier, 2003). Multi-dimensional scaling is typically a measure of the global similarity or dissimilarity of the objects under investigation (Wickelmaier, 2003). It reduces large amounts of data into easy to visualise data through visualisation representation. It is a good method for data reduction in which researchers can reduce the complexity of interrelationships between stimuli to a simpler form which is easy to understand and similar to factor analysis (Ding, 2006). It can also be used to specify the number of dimensions that can be obtained from the collected data (Davison, 1983). It is generally considered as an exploratory data analysis method (Attneave, 1950; Torgerson, 1965; Ding, 2006), while this research is confirmatory in nature as stated in Section 5.5. Also, it can be difficult to represent as the model can be highly complicated. In addition, the interpretation of the meanings of dimensions is subjective. Therefore, this method of data analysis was not used in this research.

Dichotomous Probit Regression is used to model dichotomous or binary outcome variables (Greene, 2011). In such a model, the response variable is coded as 1 or 0, corresponding to responses of true or false/ yes or no to a particular question (Greene, 2011). The dependent variable can take two values only. However, this method could not be used as while the method is used to model dichotomous binary outcome variables, the nature of the variables in the model in this study is not binary. In this research, the items of each construct were tested using a seven-point Likert scale (as stated and justified in Section 5.7). Probit models can only be used for binary outcomes which is not consistent with the nature of this research.

There are other non-parametric methods that can be used for example; the Mann-Whitney U Test, Kruskal-Wallis test and Binomial t-test. The Mann-Whitney U Test is an independent samples-t-test used to test differences between two independent groups (Norušis, 2005; Pallant, 2010). It is the alternative non-parametric test to the t-test for independent samples. The Mann-Whitney U Test was used in this research to assess non-response bias in each of the three samples. The Kruskal-Wallis test is the non-parametric alternative to the one-way between-groups ANOVA (Norušis, 2005). It allows comparing the scores on continuous variables for three or more groups (Pallant, 2010). It is similar in nature to the Mann-Whitney U Test but it extends it by allowing researchers to compare more than two groups (Pallant, 2010). The Binomial t-test procedure compares the observed frequencies of two categories of a dichotomous variable (Norušis, 2005). It is used for hypothesis testing. The above methods were not used as the model proposed in this research is complex. PLS-SEM has a high ability to test complex models (Hair et al., 2014). Furthermore, the PLS-SEM's explanatory power (R^2) enabled the researcher to accurately compare the explanatory power of the proposed conceptual framework in each of the three countries to the explanatory power of the UTAUT2 (Venkatesh et al., 2012), which this research extends. In addition, the above non-parametric analysis methods are not widely used within the area of technology adoption. PLS-SEM was used in this research as it is the most appropriate statistical technique for the following reasons;

1. PLS-SEM was used when UTAUT and UTAUT2 were developed in Venkatesh et al. (2003) and Venkatesh et al.'s (2012) studies. In addition, it was used in Loch et al.'s (2003) study, which was an extension of Straub et al. (2001). Since these studies formed the basis of the model developed in this research, the statistical technique used in this research is consistent with the statistical technique used in these studies. The use of PLS-SEM enabled the researcher to accurately compare the results of this research to the results of these studied. Furthermore, PLS-SEM has been used more widely than the other statistical methods in testing both TAM and UTAUT (Williams et al., 2015).
2. The inclusion of formative factors in the research model is the primary reason for using PLS-SEM rather than CB-SEM, as PLS-SEM does not differentiate between formative and reflective indicators (Petter et al., 2007; Henseler et al., 2009; Hair et al., 2014). Furthermore, PLS-SEM has the ability to handle single-item constructs (Hair et al., 2014). PLS-SEM enabled the researcher to analyse the three formative constructs in the research model (Technological Culturation, National IT Development and Actual Usage). Some solutions can be applied in order to analyse formative constructs in CB-SEM, for example considering each formative indicator as a separate construct or adding reflective indicators to the formative construct to balance it (Coltman et al., 2008). Nevertheless, none of these solutions were appropriate for this research, since using the first solution would have significantly increased the level of complexity of the model, which would also lead to the use of

PLS-SEM as it is more suitable for complex models. Furthermore, using the second solution would have affected the validity of the results and the conceptual domain of each of the formative constructs in the model, as the additional reflective indicators may not be applicable to the construct under investigation.

3. The level of complexity of the model in this research (the high number of variables and indicators) called for the use of PLS-SEM, as this technique has the ability to handle complex models (Henseler et al., 2009). Although the sample size used in this research is considered statistically sufficient for both CB-SEM and PLS-SEM, PLS was more useful.
4. It has been previously stated that PLS-SEM has an increased ability to handle small sample sizes in comparison to CB-SEM. Although there has been an argument regarding this statement (discussed in Section 5.12.1), PLS-SEM was preferred over CB-SEM in previous studies where the sample size was too small to be handled by CB-SEM (for example Reinartz et al., 2009).
5. PLS-SEM has a high level of statistical power (Hair et al., 2014) and its key objective is to minimise the amount of unexplained variance (maximises R^2 values) (Hair et al., 2014). It predicts the key constructs in a model (Hair et al., 2014), which was also consistent with this research aim and objectives.
6. This research is confirmatory in nature. PLS-SEM is suitable for both exploratory and confirmatory research (Gefen et al., 2000; Urbach and Ahlemann, 2010). Urbach and Ahlemann (2010) explained that although the main objective of PLS is prediction in highly complex models, it can still be used in confirmatory studies as an alternative to CB-SEM.

7. The nature of the collected data (being not normally distributed) called for the use of PLS-SEM. Unlike CB-SEM, PLS-SEM does not assume a normal distribution of the data (Henseler et al., 2009), which makes it the most suitable technique to use in this research. The data collected in this research were not normally distributed, which was another major reason for selecting PLS-SEM. This is discussed further in Chapter Six.

Appendix O includes the practical issues and limitations related to this statistical method. Although there are many software packages that can be used to assess the model in PLS such as WrapPLS or PLS-Graph, SmartPLS was selected for three main reasons. First, SmartPLS can handle complex models (with formative constructs) effectively. Second, it is user-friendly and enabled the researcher to present accurate graphical representations of the model. Third, the newest version of SmartPLS (SmartPLS 3.0) enables researchers to conduct multiple tests simultaneously as well as new tests such as PLS-MGA (multigroup analysis) and the parametric test, which helped to provide more accurate results.

5.12.2 Reflective vs. Formative Constructs

Chin (1998) explained that there are major differences between reflective and formative constructs. Formative indicators are the items that cause the constructs to exist. If one item is omitted, the construct is affected negatively (Chin, 1998). In formative constructs, the indicators are not related to each other and a change in one does not indicate a change in another, but causes a change in the construct and its conceptual domain (Coltman et al., 2008). Therefore, ensuring the content validity of the formative factors is crucial. Chin (1998) emphasised that previous studies have mistakably considered formative factors as reflective and although they obtained good fit, the validity of their results is questionable. In formative constructs, indicators represent all dimensions of the construct (Henseler et al., 2009) and deleting one indicator can severely affect the conceptual domain of the construct. Causality in formative constructs goes in the opposite direction to the usual direction in reflective indicators. The direction of causality heads from the formative indicators to their construct (Coltman et al., 2008). Distinguishing between formative and reflective indicators has been recommended in previous studies (for example; Chin, 1998; Coltman et al., 2008). The nature of the 'TC' and 'USE' constructs (being formative) was already acknowledged in Loch et al. (2003) and Venkatesh et al. (2012). However, they were reassessed in this study to confirm their statement.

Jarvis et al. (2003) provided a set of recommendations to guide researchers to decide whether a construct is formative or reflective, based on four main criteria (Table 5.2). First, direction of causality (whether from item to construct (formative) or from construct to item (reflective). Second, interchangeability of indicators (whether they have similar content and are interchangeable (reflective) or they do not share a common theme or similar content, which makes them not interchangeable (formative)). Third, covariance of indicators (reflective indicators should co-vary with each other while formative indicators do not). Fourth, nomological net of the construct indicators (reflective indicators do not have differences in their nomological net and all indicators should have the same consequences, while formative indicators may have differences in their nomological net and are not required to have the same consequences).

Table 5-2: Decision Rules for Determining Whether a Construct is Formative or Reflective

	Formative model	Reflective model
1. Direction of causality from construct to measure implied by the conceptual definition	Direction of causality is from items to construct	Direction of causality is from construct to items
Are the indicators (items) (*a*) defining characteristics or (*b*) manifestations of the construct?	Indicators are defining characteristics of the construct	Indicators are manifestations of the construct
Would changes in the indicators/items cause changes in the construct or not?	Changes in the indicators should cause changes in the construct	Changes in the indicator should not cause changes in the construct
Would changes in the construct cause changes in the indicators?	Changes in the construct do not cause changes in the indicators	Changes in the construct do cause changes in the indicators
2. Interchangeability of the indicators/items	Indicators need not be interchangeable	Indicators should be interchangeable
Should the indicators have the same or similar content? Do the indicators share a common theme?	Indicators need not have the same or similar content/indicators need not share a common theme	Indicators should have the same or similar content/indicators should share a common theme
Would dropping one of the indicators alter the conceptual domain of the construct?	Dropping an indicator may alter the conceptual domain of the construct	Dropping an indicator should not alter the conceptual domain of the construct
3. Covariation among the indicators	Not necessary for indicators to covary with each other	Indicators are expected to covary with each other
Should a change in one of the indicators be associated with changes in the other indicators?	Not necessarily	Yes
4. Nomological net of the construct indicators	Nomological net for the indicators may differ	Nomological net for the indicators should not differ
Are the indicators/items expected to have the same antecedents and consequences?	Indicators are not required to have the same antecedents and consequences	Indicators are required to have the same antecedents and consequences

Source: Jarvis et al., 2003, p.203

Unlike reflective measures, formative measures are not assessed using reliability and construct validity (convergent and discriminant validity) (Hair et al., 2014). Instead, they are assessed based on weights rather than loadings. There were ten independent variables in the research model. With reference to Jarvis et al.'s. (2003) criteria, PE, EE, SI, HT, FC, PV, CSBV and Enj are reflective constructs. On the other hand, ND and TC are formative constructs. TC was acknowledged as a formative construct in Loch et al.'s (2003) study. Also, there were two dependent variables. While BI is a reflective construct, USE is a formative construct, as acknowledged in Venkatesh et al.'s (2012) study. It was possible to test formative measures in CB-SEM by modifying construct specifications to include both reflective and formative indicators (Hair et al., 2014). However, the formative constructs in this study were adopted from previous studies and no additional reflective indicators were required. Adding unnecessary reflective indicators would have negatively affected the validity of the research.

5.12.3 Assessing the Moderators' Effects

The parametric multigroup analysis assumes a normal distribution of the data, which is not the case in this research. Appendix N provides further information on the assessment of the moderators' effects. In this research, due to the nature of the collected data, PLS-MGA was used to test the effects of the moderating variables. This was for the following reasons;

1. PLS-MGA is a non-parametric approach, so it does not assume a normal distribution of the data. The data collected from the three countries in this research were not normally distributed (see Chapter Six). Therefore, PLS-MGA was the most suitable and appropriate technique in order to reach accurate results.
2. Conducting the PLS-MGA allowed the researcher to test the effect of the moderators on all the relationships in the model, which can highlight some moderating effects which were not anticipated by the researcher.
3. Although the interaction (product indicator) is the most suitable approach for continuous variables, it does not work with formative constructs (Hair et al., 2014; Chin et al., 2003) which made it unsuitable to use in this research. PLS-MGA can be used with both types of construct (reflective and formative) in the model, so can provide accurate results in terms of comparison.
4. Henseler and Fassott (2010) recommended that if one of the variables is discrete, researchers can use PLS-MGA without alterations. Henseler and Fassott (2010) recommended that if the moderator is categorical, researchers can use group

comparison. The moderating variables age, gender, education, income and experience were categorical in the questionnaire. The use of PLS-MGA helped to reveal the differences between the groups even when the differences were insignificant. In other words, it helped to identify the context within which a relationship between two variables becomes more significant. It also helped to better understand each group's preferences, for example, males versus females.

The moderators' effects were tested only when the direct effect between the exogenous construct and the endogenous construct was significant. The PLS-MGA results (bootstrapping procedure for 500 samples) were obtained from SmartPLS. In addition to the non-parametric test, the parametric test results were also checked, since the non-parametric approach is still new to the field and its limitations are not yet well-known. However, the results of the non-parametric approach were taken into consideration as they are more applicable for the reasons stated above. The same tests were used to investigate the differences between the three countries included in the study.

5.13 Pilot Study

It is important to carry out a pilot study prior to the distribution of the actual questionnaire (Collis and Hussey, 2014). A pilot study was carried out in this research in order to ensure the validity of the instrument; more precisely, to ensure content validity. The researcher checked that different types of validity existed to ensure that the questionnaire measured what it was designed to measure. Pilot testing was also important for checking the translated Arabic version of the questionnaire. When conducting a pilot study, it is important to carefully check the whole process including data entry and data analysis before deciding on any modifications (Glewwe, 2005).

The researcher showed both the original English version and the Arabic version of the questionnaire to academics at the University of Salahddin (based in Erbil) and it was approved by them. Then, the pilot study took place by distributing 50 questionnaires face-to-face to young people in Erbil, Iraq in September 2014. A total of 47 completed questionnaires constituted the pilot study. All participants were residents of the country. The questionnaire was distributed in two selected areas (Salahddin and Hiran subdistricts in Shaqlawa district) in Erbil in the same way in which the researcher intended to distribute the final questionnaires.

The researcher tested the validity and reliability of the data as well as running a simple regression analysis during the pilot study. Descriptive statistics were also obtained through the SPSS software tool and were used to conduct the primary analysis of the data (see Appendix J). Some changes were made to the questionnaires after the pilot study by removing some of the items of the scales, removing two questions (Q9 and Q10) and applying a minor change to the wording of one question (Q6), as well as adding a question on the make of the respondents' mobile phones. The order of some constructs in the questionnaire was changed after the pilot study as they were found to have an insignificant effect on BI or USE during the simple regression analysis. Some items were dropped from some constructs for reliability and validity issues (see Appendix I). In addition, two items were dropped from TC and one item was dropped from ND, as advised by academics and some respondents who assessed the questionnaires and provided their opinions.

5.14 Ethical Considerations

Ethical considerations are critical in business research (Bryman and Bell, 2011). This research was consistent with all of Anglia Ruskin University's ethical guidelines. Full ethical approval was obtained in July 2014. All participants received the Participant Consent Form and Participant Information Sheet (Appendix L) attached to the questionnaire. This also helped to inform them that it was possible for them to withdraw from this research if they wanted. The researcher ensured that all data obtained from the questionnaires were kept anonymous and destroyed after being used in this research. No names or other core personal details of the participants were obtained at any point. The researcher followed Anglia Ruskin University's guidelines in ensuring that no harm to the researcher or the participants was done at any point during or after the data collection. The author of this research searched whether there was any local legislation in each of the three countries where the research was carried out related to conducting research there and collecting data from participants. It was found that there were no local laws or legislation related to conducting research to consumers in these countries. The author also checked the website of the Ministry of Higher Education in each of the countries studied and no legislation related to conducting research was found. The researcher also contacted government institutions including the Ministry of Higher Education, the Ministry of the Interior, Dubai Police, the municipalities of Dubai, Amman and Erbil and universities in these cities, and they all confirmed that no additional permissions to collect the data were required. Saunders et al. (2007) emphasised that ensuring all ethical principles are followed is not limited to the data collection stage but all stages of the research. The researcher ensured that all data were collected, analysed and interpreted in an honest way.

5.15 Limitations of the Methodological Approaches

This section is dedicated to outlining the limitations of the methodological approaches adopted in this research. Table (5-3) below provides a summary of the limitations associated with each of the methodological approaches.

Table 5-3 Summary of Limitations of the Methodological Approaches Adopted in this Research

Methodological approach	**Limitations**	**Justification for using it**
Positivism	In the positivism approach adopted in this research, social reality is objective and it does not allow multiple realities (Collis and Hussey, 2014). Also, it allows explanation and description but it does not allow in-depth understanding of the phenomenon under investigation.	The field of technology adoption is well defined and considered one of the most mature areas in IS research. Positivism is mainly used to study the adoption of technology by individual users (Choudrie and Dwivedi, 2005). Positivism is suitable for studying the effect of culture for cross-cultural research (Straub et al., 2002). Also, positivism is based on hypothesis testing and objective, quantitative data which allow the results to be generalised (Collis and Hussey, 2014). Therefore, positivism was the most suitable approach to achieve the aim and objectives of this research.
Objectivism	The research adopted the objectivist approach in which the researcher is distant from the research. The results are based on scientific knowledge (Collis and Hussey, 2014) and it does not allow any personal observations to be included in the results.	This study is of a correlational design and conducted with a minimum level of intervention from the researcher. The findings were extracted from actual data rather than the researcher's personal assumptions. The objectivist approach is also consistent with positivism Therefore, objectivism was the most suitable approach.

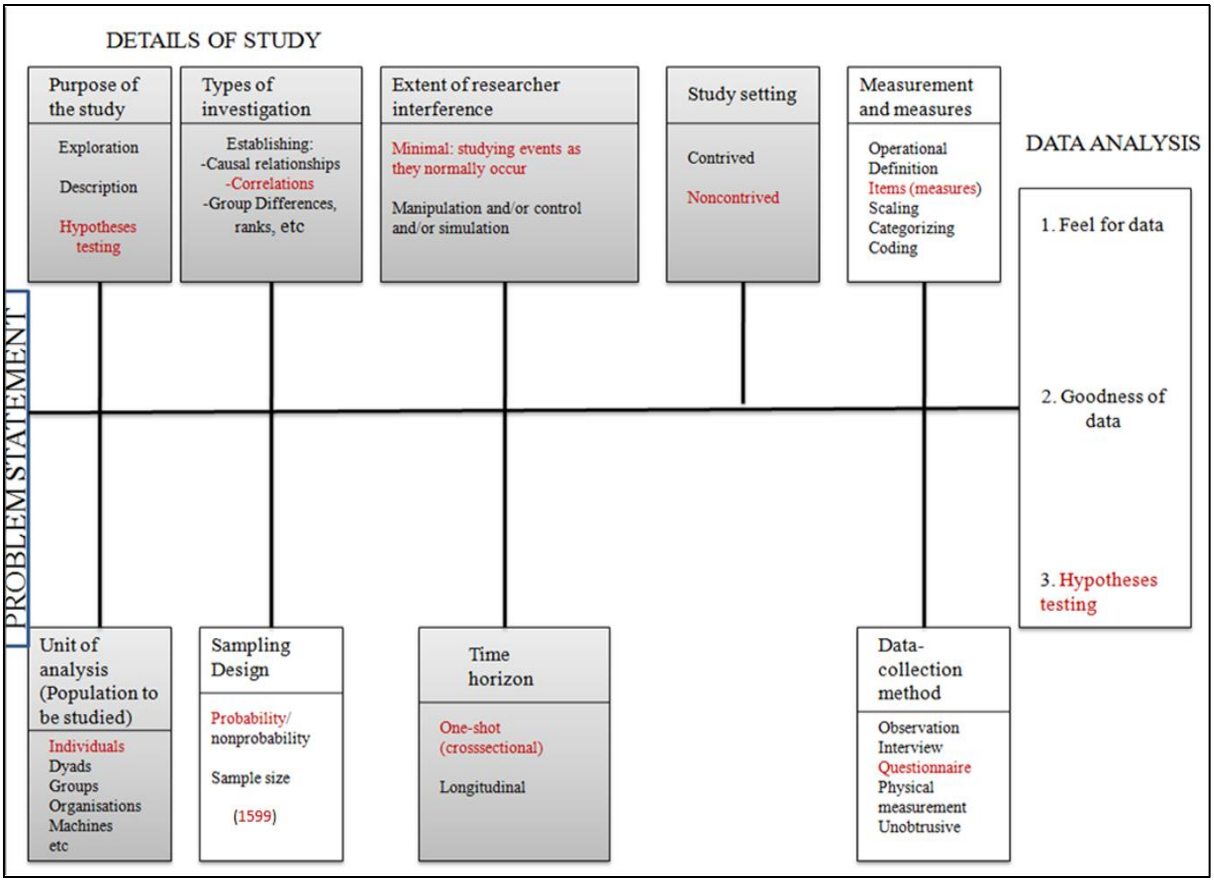
Deductive approach	The deductive approach adopted in this research is based on theory testing (Bryman and Bell, 2011) and it based on a structured, logical and formal approach which does not allow a good level of flexibility.	The deductive approach undertaken was consistent with positivism undertaken in this research. The conceptual framework was developed based on the extensive analysis of the extant literature. A significant amount of literature and theories are already available in the area of technology acceptance and usage
Research design	The broad design adopted in this research is also a limitation as the research studies mobile phone adoption and use in three different countries in one region. Although, the research studies each country separately and the data were collected, analysed and discussed separately for each country which contributed towards keeping the depth of the research balanced.	The broad design is justified as it fills the gap in the literature stated in Section 1.5 in the thesis. The selection of the three countries is justified as it is important to test how robust the model is in countries that vary in terms of cultural characteristics and the level of national IT development.
Questionnaires	Questionnaires were used to collect the quantitative data from each of the three countries. It is a quantitative method that does not allow human perceptions and beliefs (Choy, 2014). Also, it does not allow an in-depth experience description (Choy, 2014)	The use of questionnaires allowed the researcher to apply correlational statistical techniques to test the relationships between the variables in the conceptual framework developed in this research and it provides external conclusion validity. The use of questionnaires provided a higher opportunity for generalisation of the findings since the research covers a large geographical area (three countries).
Sample size	The sample size used in this research can be considered high. The research used a high number of questionnaires.	Although the sample size is considered high, it is compatible with what was used in extant literature that tested the UTAUT (Venkatesh et al., 2003) and the UTAUT2 (Venkatesh et al., 2012)

		in Arab countries to study the adoption of different technologies (as stated in section 5.10.1). Also, the research covered a large geographical area.
Multistage cluster sampling	This research adopted a multistage cluster sampling method. In this method, sampling error is hard to avoid (Bryman and Bell, 2011). Also, it relies heavily on extensive information about the different units at each stage and it contains sampling bias (Watt and Berg, 2012).	The use of multistage cluster sampling enabled the reduction of the sampling complications as the study covered large populations. Also, using this particular sampling technique helped the researcher to identify where the respondents came from.
PLS-SEM	This research used PLS-SEM to analyse the data from each of the three countries included in the study. PLS-SEM cannot be used when there are causal loops in the structural model (Hair et al., 2014). Also, collinearity can be an issue and it must be handled well (Hair et al., 2014).	The use of PLS-SEM is consistent with what was used in the studies which formed the basis of the model developed in this research namely; Venkatesh et al. (2003), Venkatesh et al. (2012) and Loch et al.'s (2003) study. Also, the conceptual framework developed in this research included formative constructs and the collected data were not normally distributed. Therefore, the use of PLS-SEM in this research is justified.

5.16 Summary and Conclusion

This section concludes the research methodology chapter. The research design selected in this research was aimed towards addressing the research objectives outlined in Chapter One. Figure 5-3 below illustrates each component of the research design as presented by Sekaran (2003). The selected approaches in this research for each component of the research design are highlighted in red.

Figure 5-3: Research Design



Source: Adopted from Sekaran, 2003, p.118

This chapter laid out the direction of the study based on the literature review. One of the main methodological contributions of this research is the use of actual young Arab mobile users and the face-to-face distribution of the questionnaires in households to validate the proposed framework, rather than using students or knowledge workers. The use of multistage cluster sampling is another contribution, as it provided the research with extended validity in comparison to other sampling methods such as convenience sampling (Collis and Hussey, 2014). The next chapter provides the data analysis and outlines the data analysis and hypothesis testing for each of the studied countries separately.

Chapter Six : Data Analysis

6.1 Introduction

This chapter provides the results of the analysis of the data conducted in this research. The analysis of the data was conducted separately for each country, to assess the hypotheses and produce the final model. This chapter is divided into four main sections: first, the Iraqi sample analysis, second, the Jordanian sample analysis, third, the UAE sample analysis, and finally, a multigroup analysis of the data from the three countries conducted for in-depth identification of the differences between the three groups.

The figures containing the measurement model of each group in each moderator in SmartPLS (which were satisfactory in terms of the factor loadings for all groups in all samples) and the tables containing the results of the parametric tests for assessing the moderators' effects can be found in Appendix Q for Iraq, Appendix R for Jordan and Appendix S for UAE.

6.2 Iraqi Sample Analysis

6.2.1 Response Rate and Non-response Bias

The questionnaires were distributed in Iraq in April 2015. A total of 533 questionnaires were distributed in households in different districts and subdistricts in Erbil (listed in Appendix K) and all 533 were collected from the respondents. Prior to handing out the questionnaire, the researcher asked the respondent's age and whether they could complete it (in Arabic). This also helped to ensure that the respondents spoke and understood Arabic. During the visual inspection of the completed questionnaires, the researcher found that 33 respondents did not have a mobile phone, so they were excluded from the research. A total of 398 completed questionnaires were used in analysis of the data collected from Iraq. The response rate was 75%.

Although the response rate was high in this study in all three countries, the researcher still assessed the collected data for non-response bias. Non-response bias is a problem that may occur due to differences between earlier and later responses or respondents who refused to or could not participate in the research. The distribution of the questionnaires took one month in Iraq. The use of t-test and ANOVA was not suitable in the case of this research, as they are parametric approaches (Henseler et al., 2009; Pallant, 2010) that assume normally distributed data, which was not the case. However, the Mann-Whitney-U-Test is a non-parametric test that can serve the same purpose and be used as an alternative to the t-test (Pallant, 2010). Therefore, the Mann-Whitney-U-Test was conducted in SPSS to assess non-response bias. The researcher examined whether there were differences between the first 50 responses and the last 50 responses in the total responses from Iraq (with an almost one-month time gap). The results of running the Mann-Whitney-U-Test (as shown in Appendix Q) revealed that non-response bias was not an issue for the Iraqi sample, as none of the differences between the groups were significant (i.e., when the p value=0.05 or lower (Pallant, 2010)).

6.2.2 Respondents' Demographic Profiles and Descriptive Statistics

Before starting with the Partial Least Squares analysis, it was important to understand the nature of the collected data and the demographic profiles of the respondents.

Descriptive statistics for the data in Sections One, Two, Three and Four of the questionnaires were obtained using SPSS IBM statistics version 20 software. All of the respondents were born in Iraq. The variable (NUMYEARS) in SPSS included the number of years the respondents had lived in Iraq. The period the respondents had lived in Iraq varied from one year to 29 years. This showed that 81.9% had lived there for 18 years or more, while 18.1% had lived there for less than 18 years (Appendix Q), demonstrating that the respondents were actually living in Iraq rather than just being visitors.

The descriptive statistics for the Iraqi sample are provided in Appendix Q in this thesis. All of the Iraqi respondents were between 18 and 29 years old: 46.7% of the respondents were aged 18-22 while 53.3% were aged 23-29. Furthermore, the sample was balanced in terms of gender, as 51% were male and 49% were female. In terms of the respondents' education level, more than half of the respondents were holders of a bachelor degree (57.8%) and 21.4% of the respondents had a high school education, 11.1% were diploma holders, 7% held a master's degree and 2.8% were at the PhD level. In terms of employment, the two major groups of respondents were employed (43.2%) and students (42.5%): there were also self-employed (6%), 4.8% unemployed and currently looking for work, 3.3% unemployed and not looking for work and 0.3% 'other'. In general, the income level of a high percentage of the respondents (74.1%) was low (less than $10,000 per year), while 14.3% of the respondents had an annual income between $10,000 to $19,000. A small percentage of the respondents had higher income levels: 6.5% had an annual income of $20,000 to $29,000, 2.3% had an annual income of $30,000 to $39,000 and only 1% had an annual income of $40,000 to $49,000 and 1.8% of $50,000 or more.

In terms of Arabic and English language fluency level, the following codes were created in SPSS;

Literacy Arabic Reading: LITARABREAD

Literacy Arabic Writing: LITARABWRITE

Literacy Arabic Speaking: LITARABSPEA

Literacy English Reading: LITENGREAD

Literacy English Writing: LITENGWRITE

Literacy English Speaking: LITENGSPEA

All Iraqi respondents were able to read Arabic easily, 96.7% of the respondents were able to write Arabic easily and 90.7% were able to speak Arabic easily. This shows that the sample qualified in terms of Arabic language fluency. As expected, the English language fluency level was significantly less than the Arabic language fluency: 77.4% of respondents were able to read English easily and 22.6% were not; 63.6% were able to write English easily while 36.4% could not; and finally, 59.3% could speak English easily while 40.7% could not.

Appendix Q shows the descriptive statistics for the responses to the questions in Section Two of the questionnaire. A new variable was created in SPSS for mobile use (MOBUSE). All respondents included in the research were users of mobile phones. In terms of the respondents’ experience in using mobile phones, a new variable was created for experience (EXP). The descriptive statistics showed that the respondents had different experience levels in using mobile phones, as 11.1% of them had used mobile phones for less than three years, 17.3% had used mobile phones for less than five years, 20.4% had used them for less than seven years, 21.9% for less than ten years and finally 29.4% had used mobile phones for more than ten years. This indicates that the respondents, generally, had a high level of experience in using mobile phones.

A new variable was also created for the respondents' mobile type (MOBTYPE). Six of the respondents did not provide information on their mobile phone type. The descriptive statistics showed that the majority of the respondents had an iPhone (37.4%) or Samsung (34.7%) while the other mobile phone types constituted small percentages: 0.5% had Blackberry, 0.3% had General, 6.8% had HTC, 5% had Lenovo, 0.5% had LG, 7% had Nokia and 6.3% had Sony. The descriptive statistics for mobile applications/services showed that the respondents used their mobile phones for making calls most frequently (mean value 6.09 and standard deviation 1.073) followed by SMS (mean value 5.62 and standard deviation 1.466), mobile Internet (mean value 5.55 and standard deviation 1.719), mobile applications (mean value 5.38 and standard deviation 1.807) and mobile social media (mean value 5.08 and standard deviation 2.020). However, mobile games (mean value 4.67, standard deviation 2.118 and variance 4.484) and mobile email (mean value 4.42, standard deviation 2.224 and variance 4.944) were used less frequently. On the other hand, as mobile banking and m-commerce are not available in Iraq, the mean value for mobile banking was 1.25 with a standard deviation of 0.532 and variance 0.283 and mean value for m-commerce was 1.19, standard deviation of 0.449 and variance of 0.202, indicating that these two applications were not used as much by the respondents.

The descriptive statistics for the Likert scale items in Section Three of the questionnaire showed that the measurement items mean values fell between 5.88 and 4.65 and their standard deviation values fell between 1.99 and 1.47.

In the final section of the questionnaire, 60.3% of the respondents indicated that there are problems facing mobile phone adoption and use, while 39.7% selected 'No' to answer this question. Out of all respondents, 40.5% selected bad Internet connection then lack of regulations (37.9%), high prices of mobile Internet (34.4%), high prices of mobile handsets (33.9%), high prices of tariffs by the provider (33.2%), poor ICT infrastructure (31.4%). On the other hand, a smaller number of people selected ethical issues (27.1%), cultural issues (25.6%), market monopoly by the provider (21.9%) and restriction of mobile applications (20.4%), and none of them selected 'Other'.

6.2.3 Data Screening

6.2.3.1 Missing Data and Unengaged Responses

In order to calculate the amount of missing data in the responses, Microsoft Excel 2007 software was used. A total of 71 questionnaires had more than 10% missing data.[14] As no remedies could be used in this case, these questionnaires were excluded from the study. For the questionnaires that had less than 10% missing data, a total of

[14]Hair et al. (2006) recommended that missing data of under 10% would not create problems, therefore should be ignored unless it occurred in a non random pattern (Hair et al., 2006). The researcher followed this recommendation. When missing data exceeded 10%, no remedies were used and the questionnaire was not included.

7 cases where there was missing data of less than 3%, the researcher inspected the nature of the missing data (i.e., whether they were important). The missing data were located in Section Three of the questionnaire (the Likert scale items). As the missing data in each single variable were less than 3%, the questionnaires were retained (Hair et al., 2014). Statistical remedies were used in SPSS IBM Version 20 software by imputing the missing values, as the missing values were in the Likert scale items. The missing values were replaced by the median value of all responses to that item as they were not problematic Likert scale data. SmartPLS also deals well with missing data. However, this issue was dealt with during the primary analysis (in SPSS), especially because the amount of missing data in the questionnaires that had less than 10% missing data was small.

Unengaged responses were also investigated in this research, as sometimes respondents select the same answers to all questions. The researcher used visual inspection and inspected the data for any unengaged responses in the Likert scale items using Excel 2007 software by calculating the standard deviation of the responses. When the standard deviation was less than 0.7 (as a seven-point Likert scale was used), cases were deleted, as it showed that the respondents were not paying attention (Hair et al., 2014). In this research, during the inspection of unengaged responses for the Likert scale items listed in Section Three of the questionnaires, the standard deviation ranged from 0 to 0.4 in 31 cases. Since these responses were not useful for the research, they were excluded. Accordingly, the final sample from Iraq was 398 questionnaires.

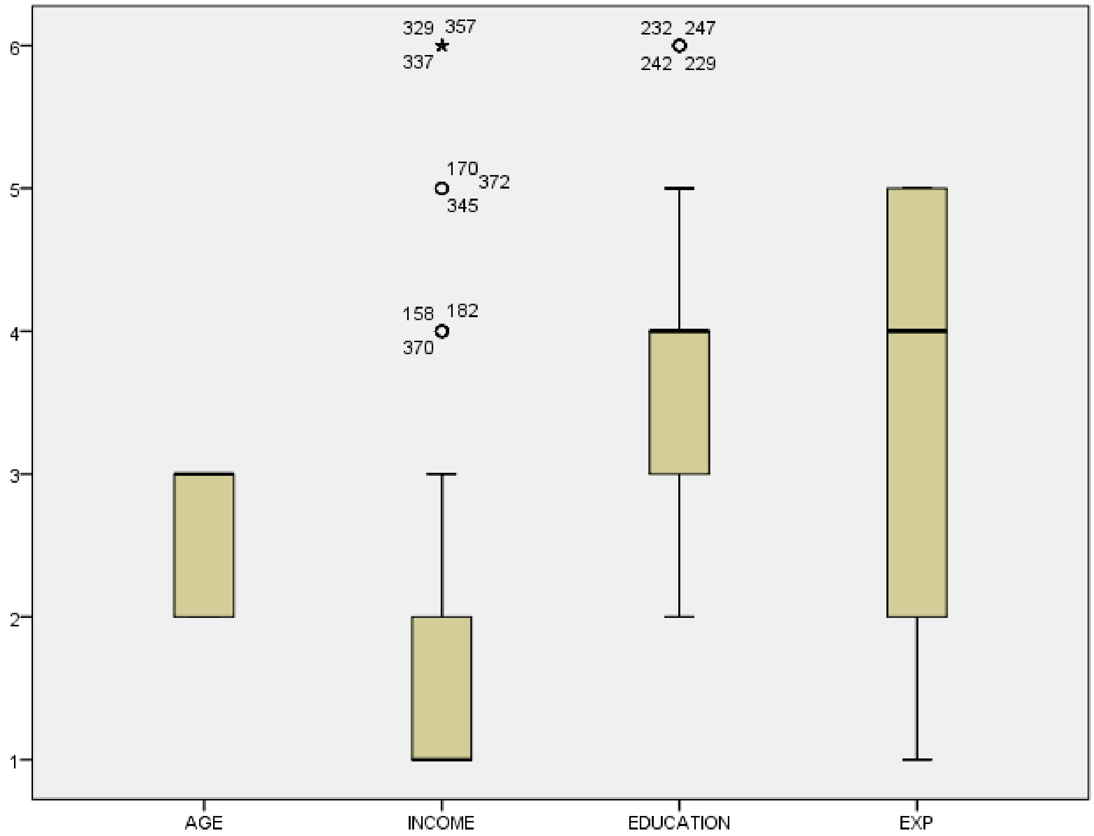
6.2.3.2 Outliers

Before proceeding further with the analysis of the data, it was essential to investigate whether there were any extreme data which were different from the other observations. The assessment of the presence of outliers was conducted using SPSS. SPSS identifies data as outliers if they are more than 1.5 box lengths from the edge of the box (Pallant, 2010). In the case of the presence of outliers, researchers need to decide whether to retain or delete them (Hair et al., 2006; Hair et al., 2014). It is important for researchers to investigate when and why outliers occur in their data, as it could be the case that these outliers form specific groups or they may have been expected prior to the analysis of the data.

In this research, the assessment of outliers was only conducted for four variables, age, income, education and experience. Outliers were detected in SPSS software using the Box and Whisker (Boxplot) approach (Pallant, 2010). As shown in Figure 6.1, there were no outliers in the age and experience variables. In terms of income, a number of cases were detected as outliers (a total of nine cases) which were above the normal range of the respondents' income in this study. However, this was expected to appear, as the respondents were expected to have different income levels. Respondents with an income level of $30,000-$39,000 to $50,000 or more were identified as outliers, as the majority of the respondents were on a low annual income level. However, they were not deleted, as they were expected to appear and it is normal to have a variety of income levels to help to identify the differences between the respondents with low and high income levels. The same logic was applied to the case of the education variable, as there were four respondents who were at the PhD degree level (cases 229, 232, 242,

247) and these were expected to appear so they were retained for further analysis. The researcher carefully inspected the cases that were identified as outliers and no problems were found.

Figure 6-1: Outliers in the Variables ‘Age’, ‘Income’, ‘Education’ and ‘Experience’ for the Iraqi Sample



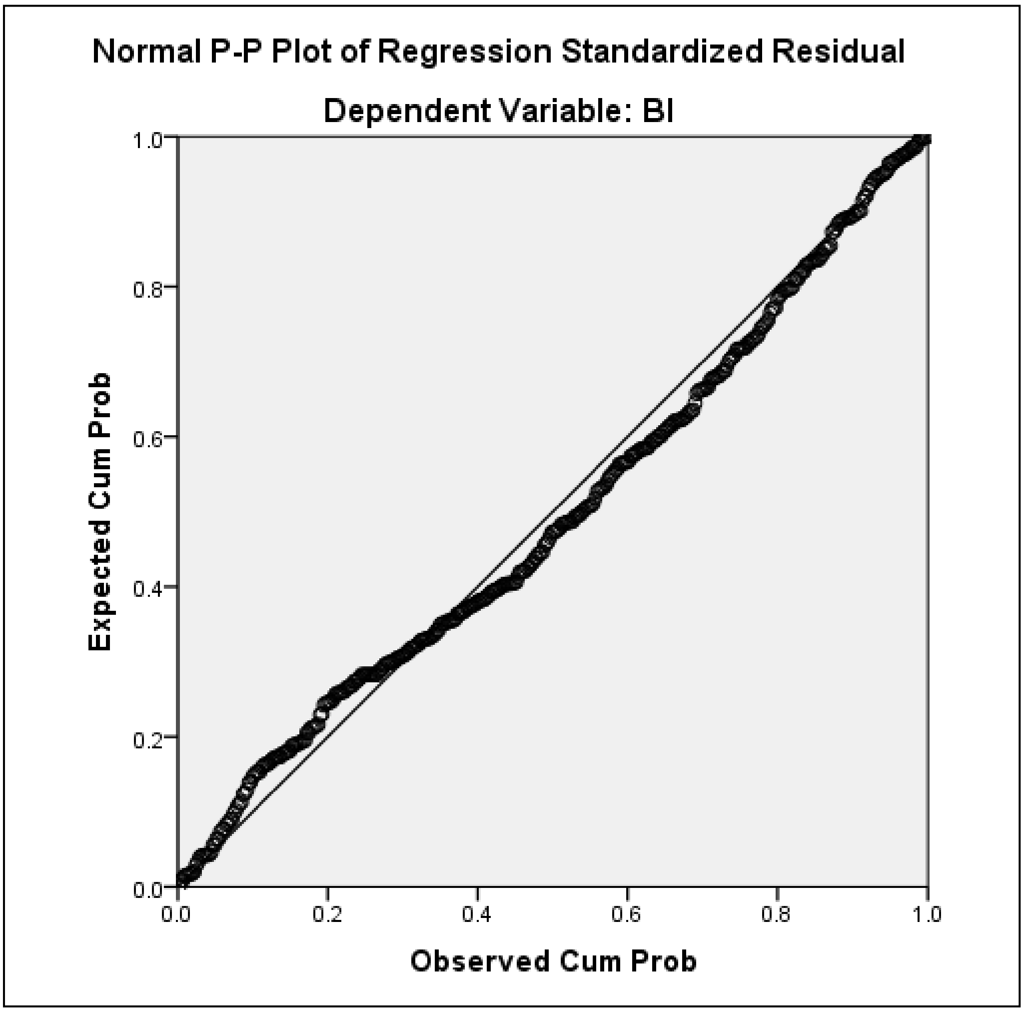
The assessment of outliers was not required for the Likert scale items as the scale was a seven-point Likert scale and the respondents were selecting one of these points based on their views. However, the researcher still conducted an examination of univariate outliers. Univariate outliers in the Likert scale measurement items were detected using the standardised scores known as z-score in SPSS. The threshold value for the standard score is ±3 (following the recommendations of Hair et al. (2006) as the sample size was considered large). The inspection showed no cases of univariate outliers. Multivariate outliers refer to outliers that occur when more than two variables are involved in a research study (Hair et al., 2006). The test used to assess whether multivariate outliers exist or not was the Mahalanobis Distances D^2 test (Mahalanobis, 1936). This test calculates the distance of the scores from the centre cluster of the other cases. This test was conducted in SPSS using the 'CDF.CHISQ' function where the Mahalanobis D^2 values and the number of variables were entered. The researcher assessed the statistical significance ($p \leq 0.001$) to detect multivariate outliers, as recommended by Hair et al. (2006). The test showed that there were no cases of multivariate outliers in the Iraqi sample.

6.2.3.3 Normality Tests

Although PLS-SEM is a non-parametric method and does not assume that the data is normally distributed, it is important to test the normality of distribution. It is important to note that if the data are extremely non-normal, the bootstrapping process can be adversely affected (Hair et al., 2014). Two main tests can be used for normality assessment: the Kolmogorov-Smirnov test and Shapiro-Wilks test (in SPSS). These two tests compare the data to a normal distribution of the mean and standard deviation and provide an indication of whether the null hypothesis (i.e., data are normally distributed) can be accepted or rejected using the sig. value (Pallant, 2010; Hair et al., 2014). The Q-Q plot can also be obtained by plotting the deviation of the scores from the line (Pallant, 2010). However, the use of skewness and kurtosis provides a more in-depth approach to understanding whether the data are normally distributed.

In this research, the normality of the distribution of the data using both the skewness and kurtosis was used. It can be affirmed that issues of skewness and kurtosis are present if the number is higher than +1 or less than -1 (Hair et al., 2014). When issues of skewness and kurtosis are present in the data, it can be assumed that the data is not normally distributed. Some researchers assume that values greater than 3.0 indicate that the data are extremely skewed (Kilne, 2005). In addition, data can be considered as having extreme kurtosis issues when the values range from 8.0 to 20.0 (West et al., 1995; Kline, 2005). The table in Appendix Q shows the values of skewness and kurtosis of the Likert scale items. The values ranged from -0.512 to -1.652, which was still below the extremely skewed data value of -3 (Kline, 2005). In terms of kurtosis, some of the data had kurtosis issues, as they exceeded the +1 value. However, the highest value was 2.109, which was also well below the extremely kurtosis data value of 8.0 as suggested by West et al. (1995) and Kline (2005). The test showed that the data had some skewness and kurtosis issues (although not extreme), which meant that the data were not normally distributed. This was also further confirmed by the inspection of the normal P-P plot of the regression standardised residual, where the data did not look completely normally distributed (Figure 6-2). This deviation from normality was another strong reason for choosing PLS-SEM in this research (Henseler et al., 2009; Dijkstra and Henseler, 2015). Negative values of skewness show that the scores are clustered at the high end and positive kurtosis shows that the distribution is clustered in the centre (peaked) (Pallant, 2010).

Figure 6-2: Normal P-P Plot of Regression Standardised Residual for the Iraqi sample



6.2.3.4 Homoscedasticity

Homoscedasticity is the level of homogeneity of variance (Hair et al., 2006). Hair et al. (2006, p.83) defined homoscedasticity as “The assumption that dependent variable(s) exhibit equal levels of variance across the range of predictor variable(s)”. Often, dealing with heteroscedasticity is linked to dealing with non-normality (Hair et al., 2006). According to Hair et al. (2006), homoscedasticity is best diagnosed visually using a scatter plot in SPSS software. If data move away from the horizontal line (in a cone-shaped distribution), the researcher can conclude that heteroscedasticity occurs in the data, and this can be expected to occur if some of the variables are skewed (Hair et al., 2006). Heteroscedasticity can occur as a result of the non-normal distribution. However, it is important to note that the presence of heteroscedasticity does not mean that the analysis is not valid. It only weakens it (Wulder, 2002). Statistical tests can also be used to detect homoscedasticity, including the Levene test (Levene, 1960), where the p value of all the variables should be above 0.05 in order for the researcher to conclude that homoscedasticity is present. However, the Levene test is sensitive to sample size, as the results can be significant if the sample size is large (Field, 2006), so it may not provide accurate results.

As the sample size for the Iraqi sample was 398, there was a preference for using scatter plots to diagnose homoscedasticity for the variables in order to examine the data accurately using visual inspection. The scatter plot for the different independent variables with the dependent variable (BI) revealed that heteroscedasticity occurred in some of the variables, including PRA, EE, PV, ND and TC but there were no extreme cases of heteroscedasticity in any of them. Moreover, the data were not normally distributed, due to skewness and kurtosis. Where heteroscedasticity occurs, Hair et al. (2006) explained that remedies can be used. Data transformation can be used to treat the issue of non-normality and accordingly heteroscedasticity. However, since there were no severe cases in terms of non-normality (i.e., skewness and kurtosis) nor in terms of heteroscedasticity, and since PLS-SEM is a non-parametric approach which does not assume the normal distribution of data (Henseler et al., 2009; Ringle et al., 2009; Reinartz et al., 2009), no remedies were required in this case of the Iraqi sample.

6.2.4 Results of Reflective Measurement Model

The measurement model of the reflective constructs in this research was assessed using the validity and reliability assessments (Hair et al., 2014). The collected data were saved in Comma Separated Value (CSV) form in order to be compatible with the requirements of the SmartPLS software. The sample size was also entered into the PLS algorithm settings.

6.2.4.1 Convergent Validity and Reliability

Convergent validity was assessed using the Average Variance Extracted (AVE), Cronbach Alpha and Composite Reliability for each reflective construct. The AVE values should exceed the minimum threshold of 0.50 (Henseler et al., 2009; Hair et al., 2014). In this research, the AVE for all reflective constructs exceeded the minimum threshold of 0.50 (as shown in Table 6-1).

The Cronbach Alpha can be defined using the following formula (Cronbach, 1951, p.299):

$$\alpha = \frac{n}{n-1}\left(1 - \frac{\sum_i V_i}{V_t}\right)$$

where:

n is the number of items

V_t is the variance of the total scores

V_i is the variance of the item scores

The Cronbach Alpha exceeded the minimum threshold of 0.70 for all reflective constructs (Table 6-1). The Cronbach Alpha for the different constructs ranged from 0.765 to 0.909. This showed that the results were satisfactory in terms of Cronbach Alpha as it exceeded 0.70 for all the constructs (Sekaran, 2003). This is also the minimum threshold value for Composite Reliability, which should also be 0.70 or higher (Hair et al., 2014). The results displayed in Table 6-1 show that the Composite Reliability for each of the reflective constructs was well above 0.70. The Composite Reliability for the different constructs ranged from 0.863 to 0.932. Reliability is measured using both Cronbach Alpha and Composite Reliability (Sekaran, 2003; Hair et al., 2014). The results of both the Cronbach Alpha and Composite Reliability were satisfactory.

Table 6-1: Results of Assessment of Convergent Validity and Reliability for the Iraqi Sample

	AVE	**Cronbach Alpha**	**Composite Reliability**
BI	0.710	0.864	0.907
CSBV	0.727	0.816	0.888
EE	0.734	0.909	0.932
ENJ	0.786	0.865	0.917
FC	0.643	0.861	0.900
HT	0.678	0.765	0.863
PV	0.752	0.890	0.924
PRA	0.754	0.891	0.925
SI	0.753	0.836	0.901

In addition, factor loadings were assessed. The loadings should be 0.70 or above (Hair et al., 2014). In this research, all reflective measurement items with loadings greater than 0.70 were retained. Only three items were deleted (including FC6, PV1 and PV6) as they were below 0.70 (0.635, 0.671 and 0.679 respectively). All items loaded significantly (loadings ranged from 0.761 to 0.904) as shown in Table 6-2 below.

Table 6-2: Results of Assessment of Convergent Validity-Factor Loadings for the Iraqi Sample

	BI	**CSBV**	**EE**	**ENJ**	**FC**	**HT**	**PV**	**PRA**	**SI**
BI1	0.846								
BI2	0.854								
BI3	0.852								
BI4	0.820								
CSBV1		0.873							
CSBV2		0.890							
CSBV3		0.791							
EE1			0.851						
EE2			0.892						
EE3			0.888						
EE4			0.817						
EE5			0.835						
Enj1				0.858					
Enj2				0.898					
Enj3				0.902					
FC1					0.775				
FC2					0.805				
FC3					0.827				
FC4					0.839				
FC5					0.761				
HT1						0.852			
HT2						0.776			
HT3						0.841			
PV2							0.840		
PV3							0.885		
PV4							0.877		

PV5							0.866		
PRA1								0.871	
PRA2								0.904	
PRA3								0.873	
PRA4								0.824	
SI1									0.855
SI2									0.884
SI3									0.864

6.2.4.2 Discriminant Validity

Discriminant validity was assessed by examining the cross-loadings of each construct, as they should load higher on their own indicators than on the other indicators of the other constructs (Chin, 1998). This was the case in this sample (as shown in Table 6.3).

Table 6-3: Results of Assessment of Discrimininant Validity-Cross-loadings for the Iraqi Sample

	BI	**CSBV**	**EE**	**ENJ**	**FC**	**HT**	**PV**	**PRA**	**SI**
BI1	**0.846**	0.579	0.591	0.363	0.454	0.582	0.551	0.585	0.395
BI2	**0.854**	0.576	0.564	0.379	0.455	0.549	0.594	0.587	0.457
BI3	**0.852**	0.523	0.470	0.394	0.439	0.613	0.630	0.508	0.425
BI4	**0.820**	0.458	0.509	0.359	0.482	0.580	0.547	0.536	0.422
CSBV1	0.628	**0.873**	0.480	0.411	0.393	0.428	0.423	0.506	0.438
CSBV2	0.566	**0.890**	0.390	0.412	0.361	0.436	0.413	0.455	0.472
CSBV3	0.380	**0.791**	0.226	0.366	0.253	0.320	0.325	0.255	0.385
EE1	0.556	0.429	**0.851**	0.383	0.606	0.447	0.397	0.687	0.287
EE2	0.520	0.351	**0.892**	0.360	0.646	0.440	0.395	0.664	0.274
EE3	0.564	0.387	**0.888**	0.308	0.643	0.454	0.376	0.667	0.314
EE4	0.475	0.348	**0.817**	0.292	0.565	0.393	0.361	0.562	0.228
EE5	0.588	0.403	**0.835**	0.331	0.532	0.404	0.381	0.602	0.263
Enj1	0.323	0.380	0.316	**0.858**	0.350	0.366	0.234	0.341	0.398
Enj2	0.368	0.373	0.353	**0.898**	0.357	0.401	0.263	0.417	0.408
Enj3	0.464	0.470	0.367	**0.902**	0.385	0.503	0.333	0.427	0.449

FC1	0.377	0.315	0.434	0.282	**0.775**	0.327	0.350	0.403	0.314
FC2	0.418	0.316	0.516	0.348	**0.805**	0.374	0.361	0.437	0.306
FC3	0.458	0.318	0.626	0.349	**0.827**	0.393	0.338	0.544	0.311
FC4	0.476	0.334	0.670	0.356	**0.839**	0.447	0.356	0.569	0.320
FC5	0.433	0.340	0.524	0.311	**0.761**	0.419	0.320	0.478	0.307
HT1	0.639	0.438	0.469	0.422	0.447	**0.852**	0.475	0.456	0.395
HT2	0.452	0.331	0.307	0.396	0.322	**0.776**	0.390	0.290	0.316
HT3	0.586	0.383	0.436	0.387	0.429	**0.841**	0.451	0.500	0.389
PV2	0.531	0.352	0.372	0.257	0.317	0.475	**0.840**	0.363	0.323
PV3	0.614	0.431	0.430	0.291	0.408	0.463	**0.885**	0.426	0.383
PV4	0.584	0.388	0.344	0.275	0.360	0.456	**0.877**	0.334	0.359
PV5	0.651	0.420	0.398	0.279	0.396	0.470	**0.866**	0.414	0.399
PRA1	0.606	0.453	0.613	0.429	0.536	0.467	0.437	**0.871**	0.468
PRA2	0.579	0.411	0.691	0.375	0.562	0.458	0.370	**0.904**	0.398
PRA3	0.595	0.447	0.690	0.409	0.525	0.472	0.405	**0.873**	0.371
PRA4	0.495	0.415	0.588	0.345	0.499	0.385	0.323	**0.824**	0.366
SI1	0.413	0.414	0.300	0.379	0.336	0.351	0.366	0.436	**0.855**
SI2	0.430	0.444	0.272	0.404	0.307	0.397	0.380	0.396	**0.884**
SI3	0.465	0.464	0.263	0.449	0.365	0.418	0.359	0.376	**0.864**

The second criterion for evaluating discriminant validity was the Fornell-Larcker Criterion (Fornell and Larcker, 1981). In this assessment, a construct should share more variance with its own indicators than it shares with the other constructs. Table 6-4 shows that the square root of each construct's AVE was greater than its highest correlation with any other constructs.

Table 6-4: Results of Assessment of Discrimininant Validity-Fornell-Larcker Criterion for the Iraqi Sample

	BI	**CSBV**	**EE**	**ENJ**	**FC**	**HT**	**PV**	**PRA**	**SI**
BI	**0.843**								
CSBV	0.635	**0.852**							
EE	0.634	0.450	**0.857**						
ENJ	0.444	0.466	0.392	**0.886**					
FC	0.542	0.404	0.698	0.412	**0.802**				

HT	0.689	0.471	0.500	0.486	0.492	**0.824**			
PV	0.689	0.461	0.446	0.318	0.429	0.537	**0.867**		
PRA	0.658	0.497	0.744	0.450	0.611	0.515	0.445	**0.869**	
SI	0.504	0.509	0.320	0.475	0.388	0.449	0.424	0.463	**0.868**

Based on the above assessment of reliability, convergent validity and discriminant validity for all reflective constructs, it was concluded that the reflective measurement model was satisfactory in terms of reliability and validity.

6.2.5 Results of Formative Measurement Model

6.2.5.1 Collinearity

In order to ensure that there were no collinearity issues in the formative constructs, the Variance Inflation Factor (VIF) was assessed.[15] VIF measures the degree of Collinearity between latent variables. The VIF was calculated for the formative constructs in this research including (USE, ND and TC). The VIF value should be below 5 (Kock, 2011) and the tolerance value should be higher than 0.20 (Hair et al., 2006). Collinearity was assessed in SPSS by using BI as a dependent variable in linear

[15]The researcher started by assessing collinearity in the formative constructs instead of testing their convergent validity. There is a debate in the existing body of literature with regard to assessing the validity of formative factors. Diamantopoulos and Winklhofer (2001) suggested using a single global item that summarises the construct to be assessed in relation to the formative measures to check validity. However, the inclusion of single-item indicators may have disadvantages (Hair et al., 2014). In fact, this technique was criticised by Mackenzie et al. (2011). The authors stated the global reflective indicators may not completely capture the conceptual domain of the construct. An alternative way to test the validity of the formative indicators is to test the variance in the construct caused by each indicator (Mackenzie et al., 2011). This method of testing the convergent validity of formative constructs was not conducted in this research for two main reasons. First, adding reflective indicators to the three formative constructs in the questionnaire would have made it longer, which would have caused a decrease in the response rate. Second, there is no theory to support the inclusion of additional reflective indicators to the formative constructs. Therefore, the researcher concentrated on ensuring the content validity of the formative constructs, which is an important aspect that must be examined.

regression to conduct the collinearity diagnosis. As shown in Table 6-5, the VIF of formative indicators ranged between 2.582 to 1.248, which showed that the VIF values for all formative indicators were below 5. In addition, the tolerance values for all formative indicators were higher than 0.20. This showed that collinearity did not present a problem in this sample.

Table 6-5: Results of Collinearity Assessment of Formative Indicators for the Iraqi Sample

	Collinearity			**Collinearity Statistics**	
Model	**Tolerance**	**VIF**	**Model**	**Tolerance**	**VIF**
TC1	0.478	2.090	CALLS	0.801	1.248
TC2	0.492	2.032	SMS	0.575	1.740
TC3	0.551	1.813	MOBINT	0.478	2.093
ND1	0.509	1.966	GAMES	0.416	2.405
ND2	0.480	2.082	MOBEMAIL	0.387	2.582
ND3	0.612	1.633	MOBAPPS	0.488	2.048
ND4	0.485	2.061	MOBSM	0.592	1.690
ND5	0.774	1.292	MOBBANK	0.677	1.476
MCOMMERCE	0.678	1.476			

6.2.5.2 Significance and Relevance

In order to assess the significance of the formative indicators, the bootstrapping procedure was run in SmartPLS software with 5000 samples and no sign changes at a 0.05 significance level ($p \leq 0.05$).[16] When analysing the formative measurement model,

[16] The outer weight is calculated using the *t* value. If the outer weight is significant, the indicator should be retained. When the indicator's outer weight is insignificant but the outer loading is high (more than 0.50), the indicator should be retained and can be considered as absolutely important rather than relatively important. On the other hand, if an indicator's weight is not significant and the outer loading is less than 0.50, the researcher should assess the significance of the indicator's outer loading. If it is significant, the researcher should decide whether to keep or delete the indicator, depending on the theory and how it supports the indicator's existence (Hair et al., 2014). If it is insignificant, the formative indicator should be deleted.

the indicator weights must be significant (Chin, 1998). Looking at the significance levels in Table 6-6, all formative indicators were significant ($p \leq 0.05$) except MOBAPPS and ND5. ND3 was on the edge, as the p value was 0.05 and the outer loading was 0.659 which was well above the threshold of 0.5, so it was at an acceptable level. However, the outer weight of MOBAPPS was not significant (p value=0.336) but the outer loading was 0.506, so it was retained. ND5's weight was also insignificant (p value=0.353). Moreover, the outer loading was 0.462 (for absolute relevance) which is below the threshold of 0.5. In this case, the researcher had to test the significance of the indicator's outer loading, which was significant (p value=0.000). As suggested by Hair et al. (2014), when the outer loading is less than 0.5 but significant, the researcher should carefully consider whether to remove or retain the indicator, as it affects the content validity of the construct. Looking back at ND5, 'I find that currently there are no restrictions to using different mobile applications', the decision taken was to retain it, as the outer loading was significant. Moreover, there was a theoretical support for the relevance of this indicator (in terms of content validity), so it was retained (Cenfetelli and Bassellier, 2009; Hair et al., 2014).

Table 6-6: Results of Assessment of Outer Weights Significance of Formative Indicators for the Iraqi Sample

	Outer weights (O)	**Standard error (STERR)**	**T Statistics (|O/STERR|)**	**Signifi-cance level**	**P Values**	**Outer loadings**	**P Value for outer loadings**
CALLS -> USE	0.281	0.070	1.966	*	0.027	0.896	0.025
SMS -> USE	0.384	0.097	3.957	***	0.000	0.782	0.000

GAMES -> USE	0.350	0.094	3.718	***	0.000	0.757	0.000
MCOMMERCE -> USE	0.279	0.059	2.270	*	0.015	0.028	0.041
MOBAPPS -> USE	**-0.106**	**0.097**	**1.090**	**NS**	**0.336**	**0.506**	**0.000**
MOBBANK -> USE	0.270	0.056	2.254	*	0.030	0.081	0.021
MOBEMAIL -> USE	0.266	0.112	2.175	*	0.041	0.675	0.000
MOBINT -> USE	0.516	0.099	5.229	***	0.000	0.868	0.000
MOBSM -> USE	0.265	0.094	2.190	*	0.036	0.483	0.000
ND1 -> ND	0.310	0.078	3.958	***	0.000	0.816	0.000
ND2 -> ND	0.464	0.074	6.272	***	0.000	0.874	0.000
ND3 -> ND	0.159	0.081	1.963	*	0.050	0.659	0.000
ND4 -> ND	0.276	0.078	3.537	***	0.000	0.776	0.000
ND5 -> ND	**0.050**	**0.053**	**0.929**	**NS**	**0.353**	**0.462**	**0.000**
TC1 -> TC	0.537	0.063	8.483	***	0.000	0.908	0.000
TC2 -> TC	0.317	0.071	4.498	***	0.000	0.811	0.000
TC3 -> TC	0.321	0.066	4.846	***	0.000	0.796	0.000

* Significance level $p \leq 0.05$. ** Significance level $p \leq 0.01$. *** Significance level $p \leq 0.001$. NS = not significant

6.2.6 Assessment of Common Method Bias (CMB)

Podsakoff et al. (2003, p.879) defined Common Method Variance (CMV) as "Variance that is attributable to the measurement method rather than to the construct the measures represent". CMV inflates the relationships between the variables. The issue cannot be detected using convergent or discriminant validity tests (Straub et al., 2004). CMB is considered as a threat to construct validity (Boudreau et al., 2001). As this research was quantitative and CMB can become a problem in self-reported studies, the first test carried out to detect whether CMB was present in this research was

Harman's test in SPSS (Appendix P provides further information on the assessment of common method bias). If one variable does not account for the majority of the variance in the model, CMV does not become an issue (Gefen et al., 2011). The results showed that with the unrotated factor analysis, the first factor accounted for only 34.264% of the total variance. This value showed that CMB was not a problem in this sample, as the factor explained less than 50% of the variance. Therefore, no further tests were required.

6.2.7 Assessment of Structural Model

6.2.7.1 Assessment of Collinearity for the Structural Model

The first step in assessing the structural model was to assess whether there were any collinearity issues in the model. This was carried out using the same rule used for assessing collinearity in the formative measurement model. When the VIF value is lower than 5 and the tolerance value is higher than 0.20, the researcher can conclude that there are no collinearity problems in the model (Hair et al., 2014). Accordingly, the researcher assessed each set of predictor constructs separately for each part of the structural model (first part EE, PRA, Enj, HT, PV, CSBV, FC, TC, ND, SI and the dependent variable BI (Table 6-7) and second part BI, HT, ND and FC and the dependent variable USE (Table 6-7). The results showed that the VIF values of the independent variables with the dependent variable BI ranged between 1.577 and 2.932, while the tolerance values ranged between 0.341 and 0.634 (Table 6-7). In addition, the VIF values of the independent variables with the dependent variable USE ranged between 1.561 and 2.632, while the tolerance values ranged between 0.380 and 0.641. The results showed that all VIF values were less than 5 and the tolerance values were higher than 0.20, indicating that collinearity problems were not present in the structural model for the Iraqi sample.

Table 6-7: Results of Collinearity Assessment of the Structural Model for the Iraqi Sample

Construct	Collinearity Statistics	
	Tolerance	VIF
PRA	0.358	2.793
FC	0.451	2.215
Enj	0.634	1.577
SI	0.585	1.710
EE	0.341	2.932
CSBV	0.480	2.084
TC	0.397	2.517
ND	0.381	2.626
PV	0.499	2.003
HT	0.511	1.957

a. Dependent Variable: BI

Construct	Collinearity Statistics	
	Tolerance	VIF
FC	0.641	1.561
ND	0.453	2.206
HT	0.509	1.965
BI	0.380	2.632

a. Dependent Variable: USE

6.2.7.2 Path Coefficients

The path coefficients between the latent variables can be assessed and evaluated based on their magnitude and significance. The path coefficients represented the hypothesised relationships in the model. Using the path coefficients, the *t* values and their significance level (*p* value)[17] (Hair et al., 2014), the path coefficients for the structural model were obtained using the bootstrapping procedure (500 samples). The structural model was set to assess 14 paths (H3 to H16) for the model (without the moderators) as shown in Table 6-8 below. Based on the path coefficients, *t* values and p value, nine paths were significant, including the paths in H3, H4, H5, H10, H11, H12, H13, H14 and H15. In this thesis, the results obtained from testing the path coefficients, their t value and significance, f^2 and q^2 from the Iraqi sample were put together to assess each of the main hypotheses. This is illustrated further in Section 6.2.9.

Table 6-8: Summary of the Direct Hypothesised results for the Iraqi Sample

	Path Coefficients	**Standard Error**	**t Statistics**	**Significance Levels**	**p Values**
BI -> USE (H3)	0.401	0.087	4.636	***	0.000
PRA -> BI (H4)	0.124	0.049	2.561	*	0.011
EE -> BI (H5)	0.127	0.052	2.421	*	0.016
SI -> BI (H6)	0.024	0.038	0.627	NS	0.531
FC -> BI (H7)	-0.028	0.037	0.749	NS	0.454
FC -> USE (H8)	-0.010	0.054	0.191	NS	0.848
ENJ -> BI (H9)	-0.044	0.033	1.338	NS	0.182
PV -> BI (H10)	0.189	0.046	4.085	***	0.000
HT -> BI (H11)	0.196	0.038	5.165	***	0.000
HT -> USE (H12)	0.220	0.075	2.921	**	0.004
TC -> BI (H13)	0.289	0.051	5.703	***	0.000
CSBV -> BI (H14)	0.094	0.047	1.989	*	0.047
ND -> BI (H15)	0.122	0.046	2.629	**	0.009
ND -> USE (H16)	0.094	0.082	1.150	NS	0.251

[17]When the *t* value is at or more than 1.96 at a 5% (p value≤0.05) significance level, the researcher can conclude that the relationship is significant at a 5% (p value≤0.05) level. Alternatively, when the *t* value is at or more than 2.58 at a 1% (p value≤0.01) significance level, the researcher can conclude that the relationship is significant at a 1% (p value≤0.01) level. In addition, when the *t* value is at or more than 3.26 at a 0.1% (p value≤0.001) significance level, the researcher can conclude that the relationship is significant at a 0.1% (p value≤0.001) level. The path coefficients should be within a 5% or less probability of error in order to be considered significant (Hair et al., 2014).

* Significance level $p \leq 0.05$. ** Significance level $p \leq 0.01$. *** Significance level $p \leq 0.001$. NS = not significant

6.2.7.3 Coefficient of Determination R^2

R^2 refers to the predictive power of the model.[18] It measures the relationship between the latent variables' explained variance and the dependent variable's total variance (Chin, 1998). The R^2 values for the endogenous variables in the model (BI and USE) were obtained using the SmartPLS software. The R^2 value for BI was 0.776, meaning that the model can explain 78% of the variance in BI. The R^2 for USE was 0.413, meaning that the model can explain 41% of the variance in USE. These results were obtained to assess the effects of the exogenous latent variables on the endogenous latent variables in the model without the inclusion of the moderators.

6.2.7.4 Effect Size f^2

The f^2 values were extracted directly through the SmartPLS software for each exogenous variable. Effect size f^2 can be estimated by considering each effect in the path model. It should be calculated based on the increase in R^2 relative to the proportion of variance of the independent variable that remains unexplained. The formula below was used (Hair et al., 2014, p.177):

$$f^2 = R^2\text{included} – R^2\text{excluded}/1\text{-}R^2\text{included}$$

where:

[18] The recommendations provided by Hair et al. (2014) for the R^2 value are 0.75 as substantial, 0.50 as moderate and 0.25 as weak.

R^2included	when the selected exogenous latent variable is included in the model
R^2excluded	when the selected exogenous latent variable is excluded from the model

The f^2 values of 0.02, 0.15 and 0.35 represent small, medium and large effects respectively of the exogenous latent variables (Henseler et al., 2009). Table 6-9 below shows that some of the exogenous variables had no effect, including SI->BI (0.001), FC->BI (0.002), FC->USE (0.000), Enj->BI (0.005), CSBV->BI (0.018), ND->USE (0.007). On the other hand, some of them had small f^2 values, including BI->USE (0.099), PV->BI (0.080), HT->BI (0.086), HT->USE (0.041), TC->BI (0.144), EE-> BI (0.024), PRA->BI (0.024) and ND->BI (0.024). These values were categorised as small effect sizes as they were above 0.02 and below 0.15 (the recommended values for small and medium effect sizes respectively). The highest f^2 value was for TC->BI (0.144), which was not far from the medium effect size threshold value.

Table 6-9: Results of Assessment of f^2 Effect Size for the Iraqi Sample Model

	f^2
BI -> USE	0.099
CSBV -> BI	0.018
EE -> BI	0.024
ENJ -> BI	0.005
FC -> BI	0.002
FC -> USE	0.000
HT -> BI	0.086
HT -> USE	0.041
ND -> BI	0.024
ND -> USE	0.007
PRA -> BI	0.024

PV -> BI	0.080
SI -> BI	0.001
TC -> BI	0.144

6.2.7.5 Predictive Relevance Q^2

The procedure for obtaining the predictive relevance values was conducted for the reflective endogenous construct only (i.e., BI), as it does not work for formative endogenous constructs (Hair et al., 2014). The Stone-Geisser Q^2 values were computed in SmartPLS using the blindfolding procedure. This was carried out using blindfolding for a given omission distance D. The number of observations used in the model estimation divided by the omission distance D should not be an integer, and the D values are between five and ten (Hair et al., 2014). A Q^2 value larger than zero shows that the reflective exogenous constructs have predictive relevance for the endogenous construct (Hair et al., 2014). According to Hair et al. (2014), the formula used to compute the q^2 (effect size) of the exogenous constructs on the endogenous construct (Hair et al., 2014, p.183) is as follows:

$$q^2 = Q^2\text{included} – Q^2\text{excluded} / 1 - Q^2\text{included}$$

where:

Q^2included running the path model with the construct

Q^2excluded running the path model without the construct

As the sample size for Iraq was 398, the default omission distance of 7 was chosen so that the result of the division did not become an integer.

After the computation of Q^2 for BI, the researcher deleted each exogenous construct in the structural model separately then manually calculated the q^2 effect size value. The q^2 values of 0.02, 0.15 and 0.35 represent small, medium and large predictive relevance respectively (Hair et al., 2014). Table 6-10 below shows the q^2 values for the paths in the model. The q^2 values for the assessed constructs ranged from 0.045 to -0.002 which indicated that the predictive relevance of the assessed relationships ranged from a small to no predictive relevance. While the relationships TC->BI (0.045), HT->BI (0.030) and PV->BI (0.024) had a small predictive relevance, the remaining relationships in the model had no predictive relevance, as they were below the threshold of 0.02 for small predictive relevance for a particular endogenous construct.

Table 6-10: Results of Assessment of q^2 Effect Size for the Iraqi Sample Model

Paths	q^2
PRA -> BI (H4)	0.009
EE -> BI (H5)	0.007
SI -> BI (H6)	-0.002
FC -> BI (H7)	-0.002
ENJ -> BI (H9)	0.000
PV -> BI (H10)	0.024
HT -> BI (H11)	0.030
TC -> BI (H13)	0.045
CSBV -> BI (H14)	0.006
ND -> BI (H15)	0.006

6.2.8 Assessing the Moderators' Effects

The PLS-MGA was adopted to compare the groups and identify the differences between them in SmartPLS. The PLS-MGA introduced by Henseler (2007) and

Henseler et al. (2009) as a non-parametric approach was adopted in this research using the PLS path analysis for each subsample (group) to test the hypotheses regarding the moderators' effects. The results of assessing each moderator's effects are discussed below.

Age

Since the age moderating variable was categorical in the survey question, it did not require any refinements. There were two groups only in this variable: 18-22 years, the 'younger users' group, 186 participants, and 23-29 years, the 'older users' group, 212 participants. The overall sample was split into two groups. The path coefficients per group in SmartPLS are shown for the significant direct paths only.

The R^2 values for BI and USE for the younger users group were 0.770 (77%) and 0.335 (34%) respectively. The R^2 values of BI and USE for the older users group were 0.794 (79%) and 0.513 (51%) respectively. The MGA analysis conducted in SmartPLS revealed the p values for group differences for all the predictors with the significant direct paths. When comparing the results between the younger users and older users groups, Table 6-11 shows that age did not significantly moderate any of the relationships in the model except PV->BI (p value=0.037). None of the remaining p values in the table were 0.05 or smaller or 0.95 or greater. Furthermore, the results showed that the effect of the relationship between PV and BI was stronger among younger users, while H10a stated that it is stronger among older users.

Table 6-11: Summary of the Moderating Effect of Age for the Iraqi sample

	R^2 Younger Users	**R^2 Older Users**
BI	0.770 (77%)	0.794 (79%)
USE	0.335 (34%)	0.513(51%)

Hypothesis	**Relationship**	**Subsample (1) Younger Users (18-22) years old**				**Subsample (2) Older users (23-29) years old**				**Path Coefficients-difference**	**p-Value (Younger users) vs Older users)**
		Path Coefficients	**Standard Error**	**t value**	**p value**	**Path Coefficients**	**Standard Error**	**t value**	**p value**		
H14a	**CSBV -> BI**	0.094	0.064	1.467	0.143	0.096	0.056	1.724	0.085	0.002	0.499
H5a	**EE -> BI**	0.142	0.058	2.437	0.015	0.060	0.056	1.079	0.281	0.082	0.155
H11a	**HT -> BI**	0.125	0.059	2.107	0.036	0.218	0.047	4.667	0.000	0.093	0.891
H12a	**HT -> USE**	0.291	0.117	2.482	0.013	0.199	0.110	1.811	0.071	0.093	0.280
H15a	**ND -> BI**	0.126	0.065	1.942	0.053	0.146	0.060	2.426	0.016	0.020	0.587
H4a	**PRA -> BI**	0.061	0.069	0.882	0.378	0.157	0.058	2.716	0.007	0.096	0.863
H10a	**PV -> BI**	0.281	0.074	3.817	0.000	0.124	0.054	2.275	0.023	0.158	0.037
H13a	**TC -> BI**	0.278	0.076	3.681	0.000	0.296	0.058	5.132	0.000	0.018	0.567

Gender

The gender variable was categorical. Two main subsamples (groups) were used: males (203 participants) and females (195 participants). The R^2 values for BI and USE for the males group were 0.784 (78%) and 0.491 (49%) respectively. Also, the R^2 values for BI and USE for the females group were 0.802 (80%) and 0.363 (36%) respectively. The MGA results revealed the p values for group differences for all the predictors with significant direct paths. Table 6-12 shows that gender significantly moderated the CSBV->BI (p value=1.000), HT->BI (p value=0.045) and PRA->BI (p value=0.050) but none of the remaining paths. Furthermore, the results showed that the effect of CSBV on BI was stronger among females than males. However, the effect of HT on BI was stronger among males. Also, the relationship between PRA and BI had a greater impact for males than for females.

Table 6-12: Summary of the Moderating Effect of Gender for the Iraqi Sample

	R^2 Male Users	R^2Female Users
BI	0.784 (78%)	0.802 (80%)
USE	0.491 (49%)	0.363 (36%)

Hypothesis	**Relationship**	**Subsample (1) Male Users**				**Subsample (2) Female users**				**Path Coefficients-difference**	**p-Value (Male users) vs (Female users)**
		Path Coefficients	**Standard Error**	**t value**	**p value**	**Path Coefficients**	**Standard Error**	**t value**	**p value**		
H14a	**CSBV -> BI**	-0.015	0.055	0.276	0.783	0.262	0.061	4.261	0.000	0.277	1.000
H5a	**EE -> BI**	0.060	0.056	1.076	0.282	0.158	0.055	2.863	0.004	0.098	0.892
H11a	**HT -> BI**	0.241	0.051	4.685	0.000	0.112	0.054	2.066	0.039	0.128	0.045
H12a	**HT -> USE**	0.336	0.096	3.484	0.001	0.115	0.124	0.925	0.356	0.221	0.081
H15a	**ND -> BI**	0.155	0.063	2.447	0.015	0.034	0.066	0.512	0.609	0.121	0.092
H4a	**PRA -> BI**	0.170	0.058	2.922	0.004	0.025	0.071	0.352	0.725	0.145	0.050
H10a	**PV -> BI**	0.163	0.058	2.790	0.005	0.237	0.066	3.570	0.000	0.074	0.801
H13a	**TC -> BI**	0.322	0.066	4.849	0.000	0.282	0.074	3.805	0.000	0.040	0.342

Education

Education was a categorical variable in the survey question. It was separated into two groups: ‘low educated users’ (diploma and below), 129 participants, and ‘high educated users’ (bachelor degree and above), 269 users. The R^2 values for BI and USE for the low educated users were 0.876 (88%) and 0.543 (54%) respectively. The R^2 values for BI and USE for the high educated users were 0.719 (72%) and 0.375 (38%) respectively. With regard to H5a (Table 6-13), the results showed that education did not moderate the relationship between EE and BI (p value=0.467). Furthermore, the results showed that education significantly moderated two other relationships (which were not part of the hypotheses), CSBV->BI (p value=0.999) which showed that the relationship was more significant for high educated users and ND->BI (p value=0.003) which showed that the relationship was more significant for low educated users.

Table 6-13: Summary of the Moderating Effect of Education for the Iraqi Sample

	R^2 Low Education level Users	R^2 High Education level Users
BI	0.876 (88%)	0.719 (72%)
USE	0.543 (54%)	0.375 (38%)

Hypothesis	**Relationship**	**Subsample (1) Low Education level**				**Subsample (2) High Education level**				**Path Coefficients-difference**	**p-Value (Low Education) vs (High Education)**
		Path Coefficients	**Standard Error**	**t value**	**p value**	**Path Coefficients**	**Standard Error**	**t value**	**p value**		
H5a	**EE -> BI**	0.107	0.054	1.979	0.048	0.101	0.054	1.868	0.062	0.007	0.467
Other relationships which were also found significant between the groups in the analysis	**CSBV -> BI**	-0.045	0.047	0.959	0.338	0.191	0.064	2.975	0.003	0.236	0.999
	ND -> BI	0.273	0.062	4.388	0.000	0.049	0.054	0.903	0.367	0.224	0.003

Income

Since there were few responses in some of the groups in the income variable, it was separated into two groups: ‘low income users’ (less than \$10,000), 295 participants, and ‘high income users’ (103 participants) for the higher income participants. The R^2 values for BI and USE for the low income users group were 0.734 (73%) and 0.375 (38%) respectively (Table 6-14). On the other hand, the R^2 values for BI and USE for the high income users were 0.881 (88%) and 0.581 (58%) respectively. The results revealed that income did not significantly moderate the relationship PV->BI (p value=0.713) or TC->BI (p value=0.583).

Table 6-14: Summary of the Moderating Effect of Income for the Iraqi Sample

	R^2 Low Income users	R^2 High Income users
BI	0.734 (73%)	0.881 (88%)
USE	0.375 (38%)	0.581 (58%)

Hypothesis	**Relationship**	**Subsample (1) Low Income users**				**Subsample (2) High Income Users**				**Path Coefficients-difference**	**p-Value (Low Income) vs (High Income)**
		Path Coefficients	**Standard Error**	**t value**	**p value**	**Path Coefficients**	**Standard Error**	**t value**	**p value**		
H10a	**PV -> BI**	0.185	0.05	3.711	0.000	0.284	0.151	1.881	0.061	0.099	0.713
H13a	**TC -> BI**	0.278	0.057	4.862	0.000	0.301	0.089	3.396	0.001	0.023	0.583

Experience

Experience was a categorical variable in the survey question. It was divided into two groups: first, the ‘low experienced users’ group (less than 3 years to less than 7 years) with 194 participants, second, the ‘high experienced users’ group (less than 10 years and more than 10 years), with 204 participants. The R^2 values for BI and USE for the low experienced users were 0.770 (77%) and 0.429 (43%) respectively. On the other hand, the R^2 values for BI and USE for the high experienced users were 0.799 (80%) and 0.439 (44%) respectively (Table 6-15). Experience did not significantly moderate any of the hypothesised relationships for this sample, as none of the p values were significant.

Table 6-15: Summary of the Moderating Effect of Experience for the Iraqi Sample

	R^2 Low Experience Users	**R^2 High Experience Users**
BI	0.770 (77%)	0.799 (80%)
USE	0.429 (43%)	0.439 (44%)

Hypothesis	**Relationship**	**Subsample (1) Low experience users**				**Subsample (2) High experience users**				**Path Coefficients-difference**	**p-Value (Low experience) vs (High experience users)**
		Path Coefficients	**Standard Error**	**t value**	**p value**	**Path Coefficients**	**Standard Error**	**t value**	**p value**		
H3a	**BI -> USE**	0.459	0.100	4.607	0.000	0.492	0.125	3.942	0.000	0.034	0.597
H14a	**CSBV -> BI**	0.124	0.062	1.993	0.047	0.055	0.057	0.967	0.334	0.068	0.208
H5a	**EE -> BI**	0.089	0.061	1.464	0.144	0.104	0.058	1.780	0.076	0.014	0.568
H11a	**HT -> BI**	0.129	0.062	2.084	0.038	0.216	0.046	4.639	0.000	0.086	0.868
H12a	**HT -> USE**	0.246	0.099	2.486	0.013	0.220	0.124	1.772	0.077	0.025	0.422

6.2.9 Results of Hypotheses Testing and Final Model

The tables for the results of the assessment of the structural model and the table containing the results of the hypotheses testing are provided in Appendix Q. The results of the analysis from the Iraqi sample showed that generally the participants accept and use mobile phones. All of the participants were users of mobile phones. This shows that Arab customers in Iraq accept and use mobile phones. Therefore, hypothesis H1 was supported for the Iraqi sample.

For the Iraqi sample, the model explained 78% of the variance in BI and 41% of the variance in the use of mobile phones. Although this is lower than the variance explained in the original UTAUT2 (Venkatesh et al., 2012), the model shows a strong predictive power and seven of the predictors were found to significantly affect BI. Therefore, H2 was supported for the Iraqi sample.

The path coefficient from BI to USE was significant with a small effect size (path coefficient=0.401, t value=4.636, p value=0.000, f^2=0.099). This showed that BI is a significant predictor of USE. Thus, H3 was supported. The results of testing the moderators' effect showed that experience did not significantly moderate the relationship between BI and USE. Therefore, H3a was rejected.

With regard to H4, the path coefficient from PRA to BI was significant with a small effect size and no predictive relevance (path coefficient=0.124, t value=2.561, p value=0.011, f^2=0.024, q^2=0.009). Therefore, H4 was supported. With regard to the hypothesised moderating effects in H4a, age did not have a significant moderating effect on the relationship between PRA and BI. In terms of gender, the relationship between PRA and BI had a greater impact for men. Therefore, H4a was partially supported.

The coefficient of the path from EE to BI was significant with a small effect size and no predictive relevance (path coefficient=0.127, t value=2.421, p value=0.016, f^2=0.024, q^2=0.007). Hence, EE had a significant effect on BI. Thus, H5 was supported. The results in the previous section showed that age, gender, experience and education did not have any significant moderating effects on the relationship between EE and BI. Thus, H5a was rejected.

The coefficient of the path from SI to BI was insignificant with no effect size and no predictive relevance (path coefficient=0.024, t value=0.627, p value=0.531, f^2=0.001, q^2=-0.002). Thereby, H6 was rejected. Based on these results, the assessment of H6a, was not conducted as the direct path with no moderating effect was not significant, so it was rejected.

With regard to H7, the coefficient of the path from FC to BI was not significant, with no effect size and no predictive relevance (path coefficient=-0.028, t value=0.749, p value=0.454, f^2=0.002, q^2=-0.002). Therefore, H7 was rejected as FC had no significant influence on BI. Based on these results, the assessment of H7a was not conducted as the direct path with no moderating effect was not significant, so it was rejected.

With regard to H8, the coefficient of the path from FC to USE was insignificant with no effect size (path coefficient=-0.010, t value=0.191, p value=0.848, f^2=0.000).

Accordingly, H8 was rejected as FC had no significant influence on BI. Based on these results, H8a was rejected, too.

The coefficient of the path from Enj to BI was not significant with no effect size and no predictive relevance (path coefficient=-0.044, t value=1.338, p value=0.182, f^2=0.005, q^2=0.000). Therefore, H9 was rejected as Enj had no significant influence on BI. The direct effect of Enj on BI was not significant, so H9a was rejected.

With regard to H10, the coefficient of the path from PV to BI was significant with a small effect size and a small predictive relevance (path coefficient=0.189, t value=4.085, p value=0.000, f^2=0.080, q^2=0.024). Therefore, H10 was supported. In fact, PV was the third most significant predictor of BI in the model for the Iraqi sample. With regard to the moderators' effects on the relationship between PV and BI, age significantly moderated the effect of PV on BI such that it was stronger among younger users. No differences between male and female users were found. Furthermore, income did not significantly moderate the relationship between PV and BI, so H10a was partially supported.

The results showed that there was a significant relationship between HT and BI. The path coefficient from HT to BI was significant with a small effect size and a small predictive relevance (path coefficient=0.196, t value=5.165, p value=0.000, f^2=0.086, q^2=0.030). Therefore, H11 was supported. Moreover, HT was the second most significant predictor of BI in the model. Age and experience did not have any significant moderating effects. However, gender had a significant moderating effect such that the effect of HT on BI was more significant among men. Therefore, H11a was partially supported.

The coefficient of the path from HT to USE was significant with a small effect size (path coefficient=0.220, t value=2.921, p value=0.004, f^2=0.041). Therefore, H12 was supported. HT was the second most significant predictor of USE (after BI). However, none of the moderators age, gender and experience had a significant moderating effect on this relationship. Therefore, H12a was rejected.

With regard to H13, the coefficient of the path from TC to BI was significant with a small effect size (although it was near to the medium effect size value of 0.15) and a small predictive relevance (path coefficient=0.289, t value=5.703, p value=0.000, f^2=0.144, q^2=0.045). Therefore, H13 was supported, as TC had a significant influence on BI. In fact, TC had the most significant effect on BI in the model for the Iraqi sample. In terms of the effects of the moderators, age, gender and income did not have any significant moderating effects. Therefore, H13a was rejected.

The path coefficient from CSBV to BI was significant with a nearly small effect size and no predictive relevance (path coefficient=0.094, t value=1.989, p value=0.047, f^2=0.018, q^2=0.006). Therefore, H14 was supported. However, CSBV had the least significant effect on BI in the model for the Iraqi sample. Age and experience did not moderate this relationship. However, gender moderated the relationship such that the relationship between CSBV was stronger among women. Therefore, H14a was partially supported. In addition, education moderated the relationship between CSBV and BI such that its effect was higher among highly educated users.

The results showed that ND has a significant effect on BI as the path coefficient was significant with a small effect size, although no predictive relevance (path coefficient=0.122, t value=2.629, p value=0.009, f^2=0.024, q^2=0.006). Therefore, H15 was supported. However, age and gender did not have moderating effects, so H15a was rejected. However, the relationship between ND and BI was moderated by education such that its effect was stronger among low educated users.

Although ND had a significant effect on BI, it did not have any significant effect on USE. The coefficient of the path was insignificant with no effect size (path coefficient=0.094, t value=1.150, p value=0.251, f^2=0.007). Therefore, H16 was rejected. Since the direct effect was insignificant, the moderators' effects were not tested and H16a was rejected, too.

6.3 The Jordanian Sample Analysis

6.3.1 Response Rate and Non-response Bias

The questionnaires were distributed in Amman, Jordan in May and June 2015. A total of 533 questionnaires were distributed in different districts and subdistricts in Amman (listed in the table in Appendix K) and collected from the respondents. The visual inspection of the filled questionnaires showed that all respondents were users of mobile phones, so none of the questionnaires were excluded. However, the visual inspection revealed that some of the questionnaires had a high amount of missing data, as only parts of Sections One and Two were completed. These 32 questionnaires were excluded. A total of 429 completed questionnaires were used in analysis of the data collected from Jordan. The response rate was 80%.

The Mann-Whitney-U-Test was used to assess the differences (as shown in the table in Appendix R). The results showed that although one of the values was 0.066, which was near to 0.05, none of the differences between the two groups was significant (i.e., when p value≤0.05 (Pallant, 2010)). Therefore, non-response bias was not a problem in the Jordanian sample.

6.3.2 Respondents' Demographic Profiles and Descriptive Statistics

All of the respondents were born in Jordan. In terms of the number of years the respondents had lived in Jordan, the results showed that the majority of the respondents were living in the country rather than just being visitors. The descriptive statistics for the Jordanian sample are provided in Appendix R. The results showed that approximately 82% of the respondents had lived in Jordan for 18 years or more while only 18% of them had lived there for less than 18 years. 38.9% of the respondents were aged 18-22 years while 61.1% were aged 23-29 years. In terms of gender, 46.9% of the respondents were males while 53.1% were females. The sample was balanced in terms of both age and gender. The results showed that a high number of the respondents were at the bachelor degree level of education (58.3%) while 23.5% were at the diploma level, 9.3% were master degree holders, 8.9% were high school graduates and none of them were at the PhD degree level. With regard to the employment status of the respondents, the highest number of respondents were employed (42.9%), followed by students (33.8%). On the other hand, 10.5% of them were unemployed and looking for work, 9.8% were self-employed and 3% were unemployed and not looking for work. In terms of income, 72.5% had an annual income of less than $10,000, 17.2% had an annual income of $10,000 to $19,000 and 6.3% had $20,000 to $29,000. Only a small segment of the respondents selected the higher income levels: 2.1% had an annual income of $30,000 to $39,000, 0.7% had an annual income of $40,000 to $49,000 and 1.2% had $50,000 or more per year. In order to assess the language fluency level of the respondents from Jordan, the same variables were created as those for the Iraqi sample (Section 6.2.2). All respondents were able to read, write and speak Arabic easily. In terms of English language fluency, 75.3% of the respondents were able to read English easily while 24.7% could not, 60.8% were able to write English easily and 39.2% were not and 56.6% were able to speak English easily and 43.4% of them were not.

With regard to Section Two of the questionnaire, the results showed that all respondents were mobile users with a good experience level, as only a small number of them (6.1%) had less than three years' experience in using mobile phones. 14.2% had less than five years' experience, 30.5% had less than seven years' experience, 20.5% had less than ten years' experience and finally 28.7% had more than ten years' experience in using mobile phones. With regard to mobile type, seven respondents did not provide information on the type of their mobile phones. The respondents were using eight types of mobile phone, with the highest number of respondents using Samsung (39.6%) followed by iPhone (23.3%) and (17.2%) used HUAWEI. Other types were also used, including HTC (5.1%). NOKIA (5.1%), SONY (4.7%), LG (2.3%) and NOTE3 (0.9%). The results from the descriptive statistics showed that the respondents use their mobile phones most frequently for making phone calls (mean 6.47 and standard deviation 0.903 with a variance of 0.815), followed by mobile apps (mean 6.18 and standard deviation 1.288) and mobile Internet (mean 6.00 and standard deviation 1.424). These were followed by mobile social media (mean 5.98 and standard deviation 1.562), mobile email (mean 5.50, standard deviation 1.677 and variance 2.811), SMS (mean 5.37 and standard deviation 1.684), games (mean 5.25, standard deviation 1.862 and the variance was high, 3.467). The lowest frequency levels occurred in mobile banking (mean 2.04, standard deviation 1.432 and variance 2.050) and m-commerce (mean 1.82, standard deviation 1.281 and variance 1.640).

As with the Iraqi sample, descriptive statistics and frequency tables were used to understand the patterns of the responses in the Likert scale items in Section Three of the questionnaire for the Jordanian sample. The mean values of the measurement items were between 5.87 and 4.86 and the standard deviation between 1.76 and 1.33.

The results of the analysis of the data in Section Four of the questionnaire regarding the challenges facing mobile phone adoption and usage revealed that 38% of all respondents thought that there are challenges facing mobile phone usage in Jordan while 62% answered 'No' to this question. The results showed that the respondents selected bad network connection most frequently (26.1%), followed by high prices of mobile handsets (25.2%) then high prices of mobile Internet by the provider (22.6%), high prices of tariffs (20.0%), ethical issues (18.4%), poor ICT infrastructure (17.5%), lack of regulations (15.2%), cultural issues (14.9%), market monopoly by the provider (12.4%) and finally, restriction on mobile applications (11%); none of them selected 'Other'. This shows that the problems of bad Internet connections and high prices of tariffs, mobile handset and mobile Internet are the four major issues/challenges identified by the respondents.

6.3.3 Data Screening

6.3.3.1 Missing Data and Unengaged Responses

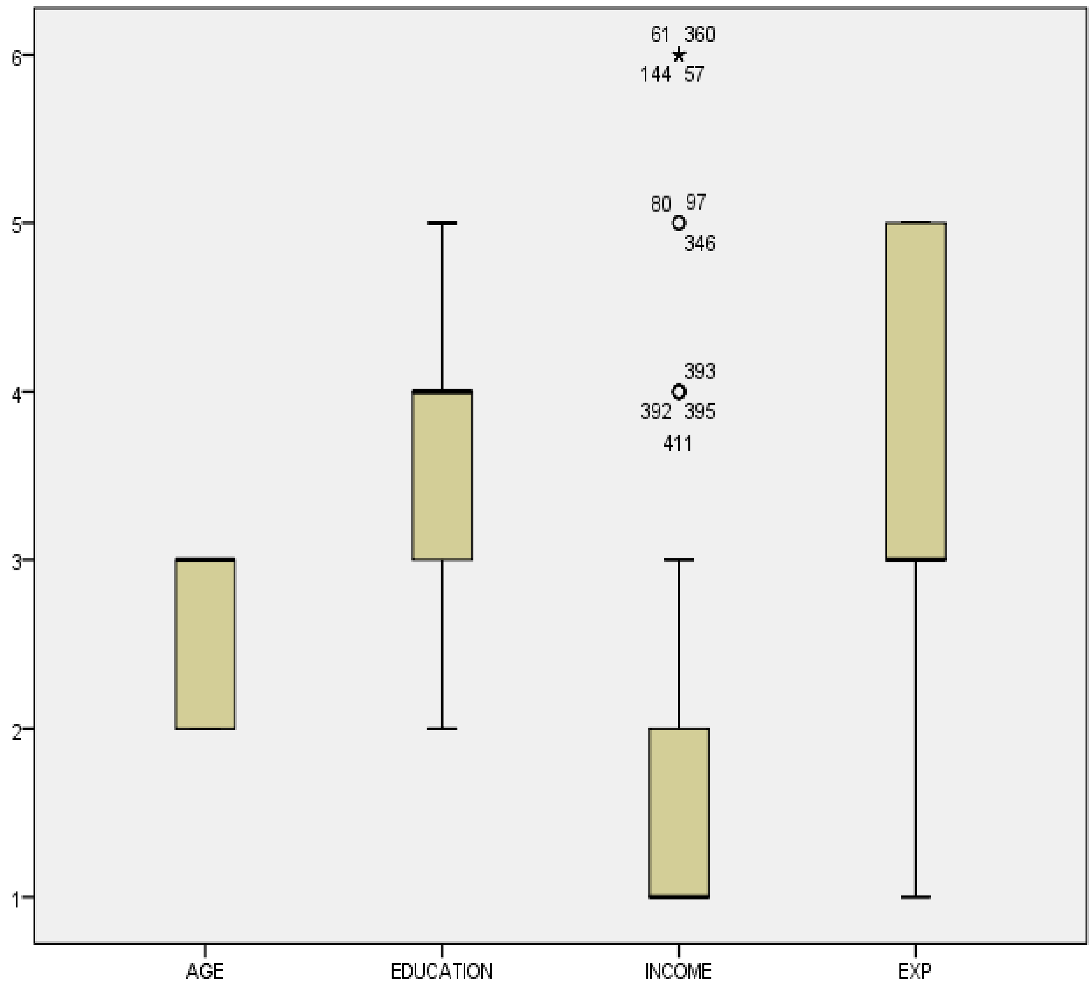
There were 61 cases where the amount of missing data was more than 10%. These cases were deleted and excluded from the research. There were 12 cases with less than 10% of missing data. These cases were visually inspected to assess whether the missing data were important. Furthermore, missing data in variables were less than 4%. The cases that had less than 10%, missing data were treated by replacing the median values for all those who had responded to the particular item in the Likert scale data, the same treatment that was used for the Iraqi sample. In terms of unengaged responses, the inspection in Microsoft Excel revealed that there were 11 cases where the standard deviation ranged from 0 to 0.48. These cases were deleted, leaving the final sample from Jordan to be a total of 429 questionnaires.

6.3.3.2 Outliers

The first assessment of outliers for the Jordanian sample was carried out using box plots in SPSS. This was mainly carried out for four variables: age, education, income and experience (Figure 6.3). A number of outliers were detected in the box plot for the income variable. Outliers marked with a '*' are extreme outliers. These were cases 57, 61, 144 and 360. The inspection of each of these cases individually showed that they were the respondents with an annual income of $50,000 or more. The information provided by the respondents including their age and education level were investigated. Accordingly, the researcher decided to retain them as they were one of the categories provided in the survey question and the age and education levels of these respondents seemed compatible with their annual income. Apart from the extreme cases, seven cases were also detected as outliers. These were cases in which the respondents had an annual income of $30,000 to $39,000 and $40,000 to $49,000. These were not deleted as they were expected to appear in the responses and they helped to identify the differences between high and low income levels, as income was a moderator in the model.

Univariate outliers in the Likert scale measurement items were detected using the z-score in SPSS. The threshold value of the standard scores was ±3. The results showed four cases where the standardised scores were lower than -3. These four cases were detected as outliers. In the case of the Jordanian sample, since the sample size can be considered large enough, the threshold of the D^2/df value was 3. After running the test, five cases were detected as outliers due to the high D^2/df values and the significance level (p value≤0.001). Hair et al. (2006) recommended that researchers can keep data identified as outliers if they do not have significant problems or if they are still representative of the observations in the population which was the case of these data. Therefore, these cases were retained.

Figure 6-3: Outliers in the Variables ‘Age’, ‘Income’, ‘Education’ and ‘Experience’ for the Jordanian Sample

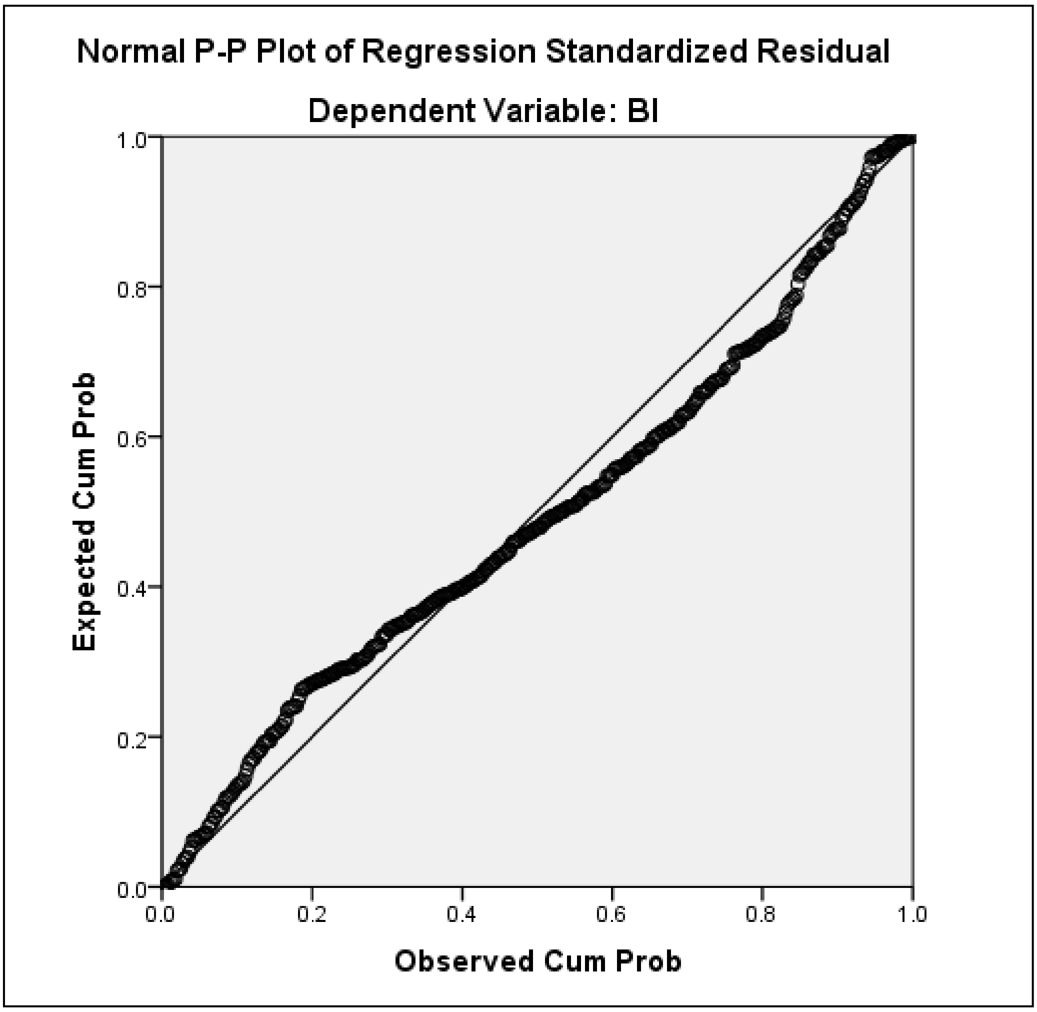


6.3.3.3 Normality Tests

The values for the items that had skewness issues ranged from -1.017 to -1.661 (Appendix R). However, none of them was at the -2.5 value level. In terms of kurtosis, high kurtosis values (above +1) occurred in many of the items, too. However, none of them exceeded the value of +2.5 except PRA2 (kurtosis value=2.750). The kurtosis values for the remaining items which had kurtosis issues ranged between 1.029 and 2.347. Although the values that occurred outside the acceptable range of skewness and kurtosis in the Jordanian sample were more than the out of range values occurring in the Iraqi sample and indicated that the data from the Jordanian sample were not normally distributed, there were no serious issues of skewness and kurtosis. Although Hair et al. (2006) stated that the values of skewness and kurtosis within the range of ±2.58 at a 0.01 significance level and ±1.96 at a 0.05 error level are the most commonly used, Pallant (2005) explained that it is normal to have skewness or kurtosis in data in social science scales as they provide an indication of the nature of the measurements (the responses of the measurements) used in the research.

Negative values of skewness indicate that the scores are clustered at the high end and positive kurtosis values indicate that the distribution is peaked (clustered in the centre) (Pallant, 2010), which is the case in the Jordanian sample. The normality plot was also inspected. The researcher conducted residual analysis using the expected normality P-P plot for the regression standardised residual. The plot revealed that the data were not normally distributed (Figure 6-4). In fact, the non-normality level of the data from Jordan was higher than that of the data from Iraq.

Figure 6-4: Normal P-P Plot of Regression Standardised Residual for the Jordanian Sample



6.3.3.4 Homoscedasticity

Since the collected data had skewness and kurtosis issues, it was expected that the data would have heteroscedasticity issues, too. As for the Iraqi sample, the scatter plot created in SPSS for each one of the independent variables and BI showed that heteroscedasticity occurred in some of the variables, including FC, Enj, SI, PRA and EE. The level of heteroscedasticity found in the data from the Jordanian sample was higher than that in the Iraqi sample, but there were no severe cases in neither of them. Therefore, no remedies (i.e., transformation of data) were required. The results of the homoscedasticity assessment (visually inspecting the data using scatter plots) supported the statement that was made in the previous section regarding the nature of the collected data from Jordan being not normally distributed.

6.3.4 Results of Reflective Measurement Model

6.3.4.1 Convergent Validity and Reliability

The AVE values were well above the minimum threshold value of 0.50, ranging from 0.664 and 0.864 (Table 6-16). The results showed that the Cronbach Alpha and Composite Reliability values for all the reflective constructs were well above the minimum threshold of 0.70. The Composite Reliability values ranged from 0.908 to 0.956, which is well above the minimum threshold of 0.70. Similarly, the values of the Cronbach Alpha ranged from 0.870 to 0.942. In summary, the results in Table 6-16 show that the reflective measurement model was satisfactory in terms of convergent validity and reliability.

Table 6-16: Results of Assessment of Convergent Validity and Reliability for the Jordanian Sample

	AVE	**Cronbach Alpha**	**Composite Reliability**
BI	0.801	0.915	0.941
CSBV	0.855	0.915	0.947
EE	0.813	0.942	0.956
ENJ	0.864	0.921	0.950
FC	0.664	0.873	0.908
HT	0.794	0.870	0.920
PRA	0.837	0.935	0.954
PV	0.801	0.916	0.941

SI	0.811	0.884	0.928

The assessment of factor loadings in SmartPLS revealed that three items were below the threshold value of 0.70, including PV5, PV6 and FC6, as the loadings were 0.524, 0.546 and 0.619 respectively. These items were removed from the model. The remaining items had high loadings so they were retained. The results in Table 6-17 show that all items loaded significantly (after the removal of PV5, PV6 and FC6). The loadings ranged from 0.718 to 0.954.

Table 6-17: Results of Assessment of Convergent Validity-Factor Loadings for the Jordanian Sample

	BI	**CSBV**	**EE**	**ENJ**	**FC**	**HT**	**PRA**	**PV**	**SI**
BI1	0.761								
BI2	0.948								
BI3	0.940								
BI4	0.918								
CSBV1		0.915							
CSBV2		0.950							
CSBV3		0.908							
EE1			0.897						
EE2			0.941						
EE3			0.936						
EE4			0.891						
EE5			0.840						
Enj1				0.908					
Enj2				0.954					
Enj3				0.926					
FC1					0.816				
FC2					0.843				
FC3					0.834				
FC4					0.857				
FC5					0.718				
HT1						0.873			

HT2						0.892			
HT3						0.908			
PRA1							0.909		
PRA2							0.931		
PRA3							0.924		
PRA4							0.895		
PV1								0.891	
PV2								0.940	
PV3								0.937	
PV4								0.807	
SI1									0.893
SI2									0.920
SI3									0.889

6.3.4.2 Discriminant Validity

The results showed that each construct was loading on its own indicators higher than the loadings on the indicators of the other constructs (as shown in Table 6-18). In addition, the results of the Fornell-Larcker Criterion (Table 6-19) showed that the constructs shared more variance with their own indicators than they shared with the other indicators of the other constructs. The square root of the AVE values of each construct was higher than its highest correlation with any other construct. In other words, the correlation of each construct with its indicators was higher than the correlation between the construct and any other construct in the model.

Table 6-18: Results of Assessment of Discrimininant Validity-Cross-loadings for the Jordanian Sample

	BI	**CSBV**	**EE**	**ENJ**	**FC**	**HT**	**PRA**	**PV**	**SI**
BI1	**0.761**	0.517	0.567	0.471	0.452	0.467	0.391	0.453	0.311
BI2	**0.948**	0.747	0.723	0.590	0.557	0.676	0.635	0.706	0.471
BI3	**0.940**	0.715	0.670	0.578	0.512	0.664	0.634	0.723	0.447

BI4	**0.918**	0.645	0.626	0.528	0.502	0.611	0.539	0.676	0.432
CSBV1	0.690	**0.915**	0.651	0.524	0.565	0.540	0.469	0.613	0.406
CSBV2	0.722	**0.950**	0.585	0.464	0.521	0.548	0.457	0.663	0.429
CSBV3	0.639	**0.908**	0.489	0.400	0.431	0.509	0.402	0.650	0.361
EE1	0.642	0.584	**0.897**	0.489	0.554	0.533	0.516	0.490	0.424
EE2	0.699	0.599	**0.941**	0.482	0.559	0.564	0.570	0.550	0.434
EE3	0.693	0.583	**0.936**	0.500	0.549	0.557	0.555	0.541	0.442
EE4	0.656	0.553	**0.891**	0.483	0.525	0.537	0.499	0.558	0.400
EE5	0.570	0.485	**0.840**	0.447	0.560	0.455	0.558	0.466	0.384
Enj1	0.527	0.457	0.481	**0.908**	0.477	0.525	0.440	0.438	0.403
Enj2	0.592	0.482	0.539	**0.954**	0.513	0.548	0.467	0.486	0.421
Enj3	0.572	0.460	0.464	**0.926**	0.477	0.553	0.419	0.445	0.434
FC1	0.408	0.455	0.433	0.390	**0.816**	0.349	0.368	0.380	0.278
FC2	0.402	0.431	0.433	0.377	**0.843**	0.354	0.332	0.377	0.259
FC3	0.434	0.377	0.465	0.369	**0.834**	0.313	0.392	0.365	0.316
FC4	0.567	0.496	0.568	0.474	**0.857**	0.425	0.499	0.458	0.330
FC5	0.455	0.460	0.543	0.511	**0.718**	0.435	0.370	0.408	0.436
HT1	0.640	0.540	0.628	0.509	0.482	**0.873**	0.495	0.506	0.427
HT2	0.534	0.459	0.400	0.516	0.350	**0.892**	0.428	0.456	0.382
HT3	0.638	0.531	0.525	0.533	0.402	**0.908**	0.437	0.538	0.434
PRA1	0.578	0.476	0.576	0.505	0.482	0.489	**0.909**	0.533	0.328
PRA2	0.566	0.450	0.528	0.415	0.451	0.456	**0.931**	0.535	0.322
PRA3	0.595	0.437	0.565	0.414	0.438	0.467	**0.924**	0.538	0.390
PRA4	0.541	0.389	0.515	0.404	0.422	0.455	**0.895**	0.490	0.309
PV1	0.591	0.656	0.545	0.461	0.466	0.469	0.524	**0.891**	0.249
PV2	0.646	0.664	0.528	0.427	0.469	0.516	0.524	**0.940**	0.295
PV3	0.738	0.680	0.560	0.477	0.469	0.562	0.564	**0.937**	0.344
PV4	0.604	0.473	0.435	0.391	0.358	0.460	0.432	**0.807**	0.297
SI1	0.474	0.457	0.525	0.428	0.453	0.466	0.408	0.360	**0.893**
SI2	0.392	0.356	0.367	0.410	0.311	0.398	0.286	0.265	**0.920**
SI3	0.391	0.340	0.336	0.375	0.298	0.387	0.287	0.263	**0.889**

Table 6-19: Results of Assessment of Discriminant Validity-Fornell-Larcker Criterion for the Jordanian Sample

	BI	CSBV	EE	ENJ	FC	HT	PRA	PV	SI
BI	**0.895**								
CSBV	0.741	**0.925**							
EE	0.725	0.624	**0.902**						
ENJ	0.608	0.502	0.533	**0.930**					
FC	0.566	0.549	0.608	0.527	**0.815**				
HT	0.683	0.576	0.589	0.583	0.466	**0.891**			
PRA	0.624	0.480	0.597	0.475	0.490	0.510	**0.915**		
PV	0.725	0.694	0.579	0.492	0.493	0.564	0.573	**0.895**	
SI	0.470	0.432	0.463	0.451	0.401	0.467	0.369	0.334	**0.900**

The results of the assessment of the convergent validity, discriminant validity and reliability of the constructs showed that the reflective measurement model was satisfactory to progress further to the analysis of the formative measurement model for the Jordanian sample.

6.3.5 Results of Formative Measurement Model

6.3.5.1 Collinearity

The results showed that the VIF values of all formative constructs' indicators (TC, ND and USE) were below the threshold value of 5 and higher than the tolerance value of 0.20 (Table 6-20). However, two items (ND1 and ND2) had relatively high collinearity (for ND2, the VIF value was 4.090 and tolerance value of 0.245 while for ND1, the VIF value was 3.948 and tolerance value of 0.253). The three indicators of TC, TC1, TC2 and TC3, had VIF values above 3 but they were relatively lower than the VIF values of ND1 and ND2. However, these values were still below the threshold values recommended by Hair et al. (2006) and Kock (2011) so they were retained, but assessed with caution in the stages of the analysis that followed.

Table 6-20: Results of Collinearity Assessment for Formative Indicators in the Jordanian Sample

	Collinearity			**Collinearity**	
Model	**Tolerance**	**VIF**	**Model**	**Tolerance**	**VIF**
TC1	0.316	3.162	CALLS	0.721	1.387
TC2	0.282	3.551	SMS	0.597	1.675
TC3	0.331	3.019	MOBINT	0.524	1.910
ND1	0.253	3.948	GAMES	0.575	1.740
ND2	0.245	4.090	MOBEMAIL	0.525	1.905
ND3	0.409	2.443	MOBAPPS	0.540	1.853
ND4	0.432	2.313	MOBSM	0.577	1.732
ND5	0.585	1.708	MOBBANK	0.566	1.767
MCOMMERCE	0.566	1.768			

6.3.5.2 Significance and Relevance

Table 6-21 shows that there were eight formative indicators that did not have a significant outer weight (p value≤0.05).

Table 6-21: Results of Assessment of Outer Weights Significance of Formative Indicators for the Jordanian sample

	Outer weights (O)	Standard error (STERR)	T Statistics (|O/STERR|)	Signi-ficance level	P Values	Outer loadings	P Values for outer loadings
CALLS -> USE	**-0.065**	**0.064**	**1.014**	**NS**	**0.311**	**0.327**	**0.000**
SMS -> USE	0.223	0.083	2.701	**	0.007	0.626	0.000
GAMES -> USE	**-0.013**	**0.074**	**0.177**	**NS**	**0.860**	**0.572**	**0.000**
MCOMMERCE -> USE	**0.036**	**0.067**	**0.538**	**NS**	**0.591**	**0.100**	**0.131**
MOBAPPS -> USE	**-0.003**	**0.081**	**0.034**	**NS**	**0.973**	**0.415**	**0.000**
MOBBANK -> USE	**-0.021**	**0.073**	**0.286**	**NS**	**0.775**	**0.085**	**0.253**
MOBEMAIL -> USE	0.452	0.073	6.231	***	0.000	0.810	0.000
MOBINT -> USE	0.559	0.073	7.620	***	0.000	0.860	0.000
MOBSM -> USE	**0.096**	**0.071**	**1.349**	**NS**	**0.178**	**0.431**	**0.000**
ND1 -> ND	0.290	0.091	3.179	**	0.002	0.887	0.000
ND2 -> ND	0.454	0.086	5.257	***	0.000	0.931	0.000
ND3 -> ND	0.184	0.079	2.329	*	0.020	0.817	0.000
ND4 -> ND	0.260	0.100	2.612	**	0.009	0.663	0.000
ND5 -> ND	**0.005**	**0.073**	**0.062**	**NS**	**0.950**	**0.478**	**0.000**
TC1 -> TC	0.513	0.150	3.410	***	0.001	0.943	0.000
TC2 -> TC	0.442	0.139	3.181	**	0.002	0.934	0.000
TC3 -> TC	**0.124**	**0.144**	**0.863**	**NS**	**0.389**	**0.835**	**0.000**

* Significance level p≤0.05. ** Significance level p≤0.01. *** Significance level p≤0.001. NS = not significant

The assessment of each individual indicator that was found with an insignificant outer weight and the decision whether to retain it or not is explained below.

CALLS -> USE: The outer weight was insignificant (p value=0.311). Furthermore, the outer loading was less than 0.5 (0.327). The researcher further assessed the significance of its loading and it was significant (p value=0.000). Hair et al. (2006) and Henseler et al. (2009) recommended that insignificant formative indicators should be retained if there is a theoretical support for their existence. Based on this, the decision was taken to retain this indicator, as although the outer loading was less than 0.5, it was significant, and removing this indicator would have adversely affected the content validity of this construct.

GAMES -> USE: The outer weight was insignificant (p value=0.860). However, the outer loading was higher than 0.5 (0.572). Therefore, this item was retained.

MCOMMERCE -> USE: The outer weight was insignificant (p value=0.591). In addition, the outer loading was less than 0.5 (0.100) and it was insignificant (p value=0.131). Therefore, this item was deleted.

MOBAPPS -> USE: The outer weight was insignificant (p value=0.973). Furthermore, the outer loading was less than 0.5 (0.415) but it was significant (p value=0.000). Therefore, the researcher decided to retain this item, particularly because it is an important item in USE.

MOBBANK -> USE: The outer weight was insignificant (p value=0.775). The outer loading was also less than 0.5 (0.085) and insignificant (p value=0.253). Since the outer loading was less than 0.5 and also insignificant, the decision was taken to delete this item.

MOBSM -> USE: The outer weight was insignificant (p value=0.178) and the outer loading was 0.431 which is less than 0.5. However, the outer weight was significant (p value=0.000). Therefore, the item was retained.

ND5 -> ND: The outer weight was insignificant (p value=0.950) and the outer loading was not significantly less than 0.5 (0.478) and it was significant (p value=0.000). Therefore, the decision was taken to retain this indicator.

TC3 -> TC was the last indicator where the outer weight was insignificant (p value=0.389). However, the outer loading was 0.835, which is higher than the threshold value of 0.50. Therefore, the item was retained for further analysis.

In summary, two formative indicators (MCOMMERCE and MOBBANK) were removed following the test of significance and relevance of the formative indicators for the Jordanian sample. Cenfetelli and Bassellier (2009) explained that the occurrence of negative significant indicators does not mean that they negatively affect the construct (unless they are expected to affect it negatively) but it means that a suppression effect may have occurred, when one of the indicators explains a significant variance in one or more other indicators instead of explaining the formative construct. When the number of indicators is high, it can be expected that some of the indicators will become insignificant or negative (Cenfetelli and Bassellier, 2009; Hair et al., 2014). The authors suggested that when a construct has a high number of indicators, the researcher can group variables into two or more constructs. There were nine indicators for the construct ‘USE’, which is high, but removing any of them would affect the content validity of the construct, as they all form part of the user’s experience when using mobile phones. However, in the case of the construct ‘USE’ in this research, from the theoretical and conceptual perspective, the nine indicators should be kept together.

Researchers should examine absolute contribution or absolute importance as well as relative importance (Hair et al., 2014). Although the items CALLS, GAMES and MOBAPPS had negative weights, these weight values were small and not significantly different from zero, and deleting them would have severely affected the content validity of the ‘USE’ construct. In fact, retaining formative items which do not have significant weights can hardly affect the final results (Hair et al., 2012). Also, they did not suffer from any collinearity issues so the problem of collinearity was ruled out. Therefore, they were retained.

6.3.6 Assessment of Common Method Bias (CMB)

As for the Iraqi sample, the CMB was assessed using Harman’s test in SPSS. The results showed that with the unrotated factor analysis, the first factor accounted for 38.552% of the variance. Although this value was higher than that for the Iraqi sample (Section 6.2.6), it was still lower than the threshold value of 50%, so no further tests for CMB were required.

6.3.7 Assessment of Structural Model

6.3.7.1 Assessment of Collinearity for the Structural Model

The collinearity assessment of the structural model was carried out separately for each dependent variable (BI and USE) (Table 6-22). The assessment of the first set of predictors, FC, Enj, SI, PRA, EE, CSBV, TC, ND, PV and HT and the dependent variable BI showed that all VIF values were lower than 5 and tolerance values higher than 0.20. The highest value in the set of predictors was 3.219, which was still well below the threshold value of 5. Then, the assessment of the second set of predictors, FC, ND, HT and BI and the dependent variable USE showed that all VIF values were well below 5 (they ranged between 1.688 and 2.846) and the tolerance values were higher than 0.20. This showed that the structural model did not have any collinearity issues

Table 6-22: Results of Collinearity Assessment of the Structural Model for the Jordanian Sample

Construct	Collinearity Statistics	
	Tolerance	VIF
FC	.497	2.013
Enj	.527	1.897
SI	.648	1.542
PRA	.561	1.782
EE	.381	2.628
CSBV	.356	2.806
TC	.554	1.805
ND	.311	3.219
PV	.440	2.273
HT	.484	2.065

a. Dependent Variable: BI

Construct	Collinearity Statistics	
	Tolerance	VIF
FC	.592	1.688
ND	.394	2.536
HT	.528	1.894
BI	.351	2.846

a. Dependent Variable: USE

6.3.7.2 Path Coefficients

The bootstrapping procedure of 500 samples revealed the results shown in Table 6-23. Based on the inspection of the path coefficients, t values and p values in the table, it was concluded that all the paths were significant except in H6, H7, H8 and H13, which were insignificant. The results obtained from the path coefficients, t values and p values are further explained and used to test the hypotheses in Section 6.3.9.

Table 6-23: Summary of the Direct Hypothesised results for the Jordanian Sample

	Path Coefficient	Standard Error	t Statistics	Significance Levels	p Values
BI -> USE (H3)	0.284	0.101	2.822	**	0.005
PRA -> BI (H4)	0.099	0.043	2.310	*	0.021
EE -> BI (H5)	0.125	0.055	2.269	*	0.024
SI -> BI (H6)	-0.012	0.027	0.435	NS	0.664
FC -> BI (H7)	-0.019	0.039	0.483	NS	0.630
FC -> USE (H8)	0.072	0.063	1.159	NS	0.247
ENJ -> BI (H9)	0.099	0.032	3.110	**	0.002
PV -> BI (H10)	0.197	0.057	3.487	***	0.001
HT -> BI (H11)	0.137	0.038	3.578	***	0.000
HT -> USE (H12)	0.175	0.067	2.608	**	0.009
TC -> BI (H13)	-0.022	0.033	0.657	NS	0.511
CSBV -> BI (H14)	0.160	0.060	2.676	**	0.008
ND -> BI (H15)	0.306	0.067	4.560	***	0.000
ND -> USE (H16)	0.285	0.104	2.748	**	0.006

* Significance level $p \leq 0.05$. ** Significance level $p \leq 0.01$. *** Significance level $p \leq 0.001$. NS = not significant

6.3.7.3 Coefficient of Determination R^2

The R^2 values for the endogenous variables in the model including BI and USE were 0.777 and 0.510 respectively. This means that the model can explain 78% of the variance in BI and 51% of the variance in USE. This shows that the model (for the direct relationships) has a higher predictive power in explaining the variance in actual use than it had for the Iraqi sample (Section 6.2.7.3).

6.3.7.4 Effect Size f^2

Based on the threshold values, it was found that all of the relationships had a small effect size except SI->BI (0.000), FC->BI (0.001), FC->USE (0.007) and TC->BI (0.001) which did not have any effect. The highest effect size value was 0.121 for ND->BI, followed by PV->BI, with an effect size value of 0.072, then ND->USE (0.060). The results are shown in Table 6-24 below.

Table 6-24: Results of Assessment of f^2 Effect Size for the Jordanian Sample Model

	f^2
BI -> USE	0.051
CSBV -> BI	0.040
EE -> BI	0.025
ENJ -> BI	0.024
FC -> BI	0.001
FC -> USE	0.007
HT -> BI	0.040
HT -> USE	0.033
ND -> BI	0.121
ND -> USE	0.060
PRA -> BI	0.024
PV -> BI	0.072
SI -> BI	0.000
TC -> BI	0.001

6.3.7.5 Predictive Relevance Q^2

As with the Iraqi sample, the predictive relevance of the exogenous variables for the reflective endogenous variable (BI) was obtained using the blindfolding procedure in SmartPLS. The default omission distance of 7 was used to avoid the results of the division to be an integer. The q^2 values were then calculated manually. The results showed that many of the relationships had a predictive relevance lower than the small predictive relevance value of 0.02, apart from four relationships that had a small predictive relevance: PV->BI (0.036), ND->BI (0.057), HT->BI (0.020) and CSBV->BI (0.018 (nearly 0.02)). SI, FC and TC had no predictive relevance. The results are shown in Table 6-25 below.

Table 6-25: Results of Assessment of q^2 Effect Size for the Jordanian Sample Model

Paths	q^2
PRA -> BI (H4)	0.010
EE -> BI (H5)	0.010
SI -> BI (H6)	0.000
FC -> BI (H7)	0.000
ENJ -> BI (H9)	0.010
PV -> BI (H10)	0.036
HT -> BI (H11)	0.020
TC -> BI (H13)	0.000
CSBV -> BI (H14)	0.018
ND -> BI (H15)	0.057

6.3.8 Assessing the Moderators' Effects

Age

The first moderator 'age' had two groups including the 'younger users' group (18-22 years), 167 respondents and the 'older users' group (23-29 years), 262 respondents. The R^2 value for BI was 0.770 (77%) and for USE 0.523 (52%) in the younger users group (Table 6-26). On the other hand, the R^2 value for BI was 0.798 (80%) and for USE 0.532 (53%).

The PLS-MGA results showed that there were only two relationships which were significantly different between the two groups. First, EE->BI (p value=0.962): the effect of EE on BI was stronger among the older users group than the younger users group. Second, HT->BI (p value=0.028): the effect of HT on BI was stronger among the younger users group than the older users group.

Table 6-26: Summary of the Moderating Effect of Age for the Jordanian Sample

	R^2 Younger Users	R^2 Older Users
BI	0.770 (77%)	0.798 (80%)
USE	0.523 (52%)	0.532 (53%)

Hypothesis	**Relationship**	**Subsample (1) Younger Users (18-22) years old**				**Subsample (2) Older users (23-29) years old**				**Path Coefficients-difference**	**p-Value (Younger users) vs (Older users)**
		Path Coefficients	**Standard Error**	**t value**	**p value**	**Path Coefficients**	**Standard Error**	**t value**	**p value**		
H14a	**CSBV -> BI**	0.191	0.093	2.057	0.040	0.094	0.070	1.349	0.178	0.096	0.196
H5a	**EE -> BI**	0.008	0.074	0.112	0.911	0.185	0.061	3.030	0.003	0.177	0.962
H9a	**Enj -> BI**	0.119	0.055	2.189	0.029	0.076	0.040	1.912	0.056	0.043	0.257
H11a	**HT -> BI**	0.220	0.053	4.168	0.000	0.071	0.053	1.330	0.184	0.149	0.028
H12a	**HT -> USE**	0.231	0.126	1.840	0.066	0.152	0.087	1.759	0.079	0.079	0.310
H15a	**ND -> BI**	0.306	0.103	2.967	0.003	0.297	0.062	4.753	0.000	0.009	0.497
H16a	**ND -> USE**	0.212	0.129	1.646	0.100	0.454	0.139	3.263	0.001	0.243	0.900
H4a	**PRA -> BI**	0.098	0.056	1.733	0.084	0.099	0.064	1.550	0.122	0.001	0.495
H10a	**PV -> BI**	0.192	0.071	2.702	0.007	0.234	0.085	2.746	0.006	0.042	0.639

Gender

The main two groups of the 'gender' variable were the 'males' group (201 males) and the 'females' group (228 females). The R^2 values for BI and USE for the males group were 0.776 (78%) and 0.466 (47%) respectively. On the other hand, the R^2 values for BI and USE for the females group were 0.811 (81%) and 0.582 (58%) respectively (Table 6-27). The results of the PLS-MGA test showed that there were no significant differences between the two groups in most of the relationships. Only three paths were significantly different between the two groups. First, ND->BI (p value=0.993): the effect of ND on BI was stronger among the females group than the males group. Second, PRA->BI (p value=0.042), as PRA had a stronger effect on BI for the males group than the females group. Third, PV->BI (p value=0.050), as the effect of PV on BI was stronger among the males group than the females group.

Table 6-27: Summary of the Moderating Effect of Gender for the Jordanian Sample

	R^2 Male Users	R^2 Female Users
BI	0.776 (78%)	0.811 (81%)
USE	0.466 (47%)	0.582 (58%)

Hypothesis	**Relationship**	**Subsample (1) Male Users**				**Subsample (2) Female users**				**Path Coefficients-difference**	**p-Value (Male users) vs (Female users)**
		Path Coefficients	**Standard Error**	**t value**	**p value**	**Path Coefficients**	**Standard Error**	**t value**	**p value**		
H14a	**CSBV -> BI**	0.115	0.061	1.879	0.061	0.183	0.095	1.920	0.055	0.068	0.722
H5a	**EE -> BI**	0.064	0.082	0.783	0.434	0.132	0.053	2.480	0.013	0.067	0.756
H9a	**Enj -> BI**	0.094	0.058	1.618	0.106	0.083	0.043	1.947	0.052	0.011	0.431
H11a	**HT -> BI**	0.167	0.068	2.444	0.015	0.072	0.048	1.484	0.139	0.095	0.128
H12a	**HT -> USE**	0.106	0.116	0.922	0.357	0.244	0.074	3.291	0.001	0.138	0.845
H15a	**ND -> BI**	0.159	0.068	2.346	0.019	0.427	0.086	4.960	0.000	0.268	0.993
H16a	**ND -> USE**	0.345	0.150	2.306	0.022	0.349	0.135	2.593	0.010	0.004	0.499
H4a	**PRA -> BI**	0.181	0.073	2.487	0.013	0.040	0.042	0.961	0.337	0.142	0.042
H10a	**PV -> BI**	0.294	0.078	3.772	0.000	0.130	0.069	1.873	0.062	0.164	0.050

Education

The 'education' moderator variable was separated into 'low educated users' (high school and diploma), 139 users, and 'high educated users' (bachelor degree and master degree), 290 users. The R^2 values for BI and USE for the 'low educated users' group were 0.834 (83%) and 0.590 (59%) respectively. The R^2 values for BI and USE for the 'high educated users' group were 0.775 (78%) and 0.507 (51%) respectively (Table 6-28). Education moderated the relationship between EE and BI (p value=0.982) such that the relationship was stronger among high educated users. In addition, the inspection of the results for the remaining relationships (to see if education moderated any of the other relationships) showed that education moderated the relationship between PV and BI (p value=0.003) such that its effect was stronger among the low educated users group.

Table 6-28: Summary of the Moderating Effect of Education for the Jordanian Sample

	R^2 Low Education level Users	R^2 High Education level Users
BI	0.834 (83%)	0.775 (78%)
USE	0.590 (59%)	0.507 (51%)

Hypothesis	**Relationship**	**Subsample (1) Low Education level**				**Subsample (2) High Education level**				**Path Coefficients-difference**	**p-Value (Low Education) vs (High Education)**
		Path Coefficients	**Standard Error**	**t value**	**p value**	**Path Coefficients**	**Standard Error**	**t value**	**p value**		
H5a	**EE -> BI**	-0.013	0.063	0.210	0.834	0.176	0.062	2.854	0.004	0.189	0.982
Other relationships which were also found significant between the groups in the analysis	**PV -> BI**	0.466	0.111	4.202	0.000	0.133	0.058	2.276	0.023	0.333	0.003

Income

As there were a small number of responses in some of the groups in the 'income' variable, it was separated into two main groups: 'low income users' (311 responses), respondents with an annual income less than $10,000 and the 'high income users' (118 responses), the higher income groups. The R^2 values for BI and USE for the low income users were 0.779 (78%) and 0.546 (55%) respectively. The R^2 values for BI and USE for the high income users were 0.826 (83%) and 0.475 (48%) respectively. Table 6-29 shows the PLS-MGA results for the income moderator's effect for the Jordanian sample. Income significantly moderated the relationship PV->BI (p value=0.005). The effect of PV on BI was stronger among low income users than high income users. On the other hand, the relationship Enj->BI was not significantly moderated by income (p value=0.880). The test also showed that income moderated the relationship CSBV->BI (p value=0.999) such that its effect was stronger among the high income users than the low income users.

Table 6-29: Summary of the Moderating Effect of Income for the Jordanian Sample

	R^2 Low Income users	**R^2 High Income users**
BI	0.779 (78%)	0.826 (83%)
USE	0.546 (55%)	0.475 (48%)

Hypothesis	**Relationship**	**Subsample (1) Low Income users**				**Subsample (2) High Income Users**				**Path Coefficien ts-difference**	**p-Value (Low Income) vs (High Income)**
		Path Coefficien -ts	**Standard Error**	**t value**	**p value**	**Path Coefficients**	**Standard Error**	**t value**	**p value**		
H10a	**PV -> BI**	0.241	0.058	4.150	0.000	-0.135	0.119	1.128	0.260	0.375	0.005
H9a	**ENJ -> BI**	0.051	0.044	1.152	0.250	0.136	0.056	2.410	0.016	0.085	0.880
Other relationships which were also found significant between the groups in the analysis	**CSBV -> BI**	0.082	0.055	1.489	0.137	0.554	0.151	3.684	0.000	0.472	0.999

Experience

The ‘experience’ variable was separated into two groups. The first group was the ‘low experienced users’ group (less than 3 years to less than 7 years), 218 users. The second group was the ‘high experienced group’ (less than 10 years and more than 10 years), 211 users. The R^2 values for BI and USE for low experienced users were 0.736 (74%) and 0.491(49%) respectively. The R^2 values for BI and USE for the high experienced users were high (R^2=0.853 (85%) for BI and R^2=0.560 (56%) for USE) (Table 6-30). The findings from running the PLS-MGA test showed that experience moderated two of the hypothesised relationships in the model: CSBV->BI (p value=0.998) and HT->BI (p value=0.005). The results indicated that the effect of CSBV on BI was stronger among high experienced users, which was anticipated. The effect of HT on BI was stronger among the low experienced users, which was not consistent with what was hypothesised in this research. In addition to the hypothesised moderating effects of experience on the relationships in the model, the results showed that experience had a significant moderating effect on the relationship PRA->BI (p value=0.032), and the effect of PRA on BI was stronger among the low experienced users group.

Table 6-30: Summary of the Moderating Effect of Experience for the Jordanian Sample

	R^2 Low Experience Users	**R^2 High Experience Users**
BI	0.736 (74%)	0.853(85%)
USE	0.491 (49%)	0.560 (56%)

Hypothesis	**Relationship**	**Subsample (1) Low experience users**				**Subsample (2) High experience users**				**Path Coefficients-difference**	**p-Value (Low experience) vs (High experience users)**
		Path Coefficients	**Standard Error**	**t value**	**p value**	**Path Coefficients**	**Standard Error**	**t value**	**p value**		
H3a	**BI -> USE**	0.435	0.126	3.462	0.001	0.168	0.166	1.012	0.312	0.267	0.095
H14a	**CSBV -> BI**	0.064	0.054	1.185	0.236	0.376	0.101	3.716	0.000	0.312	0.998
H5a	**EE -> BI**	0.078	0.067	1.152	0.250	0.072	0.059	1.222	0.222	0.006	0.473
H11a	**HT -> BI**	0.199	0.056	3.558	0.000	0.000	0.053	0.001	0.999	0.199	0.005
H12a	**HT -> USE**	0.127	0.097	1.307	0.192	0.212	0.092	2.290	0.022	0.085	0.738
H9a	**Enj->BI**	0.127	0.059	2.155	0.032	0.050	0.033	1.526	0.128	0.076	0.126
Other relationships which were also found significant between the groups in the analysis	**PRA -> BI**	0.181	0.057	3.185	0.002	0.038	0.054	0.698	0.485	0.148	0.032

6.3.9 Results of Hypotheses Testing and Final Model

A summary of the final results is shown in Appendix R. The results for the Jordanian sample showed that participants accept and use mobile phones on a regular basis. Their use of different mobile applications was higher than the participants in the Iraqi sample in terms of making calls and other applications such as mobile Internet and mobile games. Moreover, the level of experience in using mobile phones was acceptable, with most of the participants having five years or more of experience in using mobile phones. This showed that young Jordanians accept and use mobile phones. Therefore, H1 was supported for the Jordanian sample.

With regard to H2, Jordan's model had an acceptable explanatory power in terms of both BI and USE. The model can explain 78% of the variance in BI and 51% of the variance in USE. The model showed a strong predictive power in terms of BI and USE, with a total of seven significant predictors of BI and two predictors of USE. Therefore, H2 was supported. In fact, Jordan's model had a higher explanatory power than did Iraq's model.

The path coefficient from BI to USE was significant with a small effect size (path coefficient=0.284, t value=2.822, p value=0.005, f^2=0.051). These results showed that BI was a significant predictor of USE, so H3 was supported for the Jordanian sample. With regard to the hypothesised moderating effect of experience, the results showed that experience did not moderate this relationship. Therefore, H3a was rejected.

The path coefficient from PRA to BI was significant with a small effect size but no predictive relevance (path coefficient=0.099, t value=2.310, p value=0.021, f^2=0.024,

q^2=0.010). This showed that H4 in this research was supported for the Jordanian sample. The results showed that age did not moderate the relationship. However, gender moderated this relationship, as the effect of PRA on BI was stronger among men. Therefore, H4a was partially supported. However, the new finding in this research with regard to the effect of the moderators on the relationship between PRA and BI was that experience moderated the relationship between PRA and BI such that the effect of PRA on BI was stronger among users with a low experience level.

With regard to H5, the path coefficient from EE to BI was significant with a small effect size and no predictive relevance (path coefficient=0.125, t value=2.269, p value=0.024, f^2=0.025, q^2=0.010). Therefore, H5 was supported. The results showed that EE had the least significant effect on BI in the model among all predictors. The results showed that age moderated the relationship between EE and BI and the effect of EE on BI was stronger among older users. However, gender did not have a moderating effect on this relationship and nor did experience. Surprisingly, the effect of EE was found to be a stronger predictor of BI among the high educated users group, which was not originally anticipated in this research. Therefore, H5a was only partially supported.

With regard to H6, H7 and H8, the results showed that SI and FC did not have a significant effect on BI and no size effect nor predictive relevance (for SI, the path coefficient=-0.012, t value=0.435, p value=0.664, f^2=0.000, $q^{2=}$0.000 and for FC, the path coefficient=-0.019, t value=0.483, p value=0.630, f^2=0.001, q^2=0.000). In addition, FC did not have a significant effect on USE and no effect size (path coefficient=0.072, t value=1.159, p value=0.247. f^2=0.007). Therefore, H6, H7 and H8 were rejected for the Jordanian sample. As these hypotheses were rejected, the moderating effects on all these relationships were not tested, so H6a, H7a and H8a were rejected.

The assessment of the relationship between Enj and BI revealed that Enj had a significant influence on BI with a small effect size. However, the relationship had no predictive relevance (path coefficient=0.099, t value=3.110, p value=0.002, f^2=0.024, q^2=0.010). Thus, H9 was supported for the Jordanian sample. However, none of the moderators age, gender, experience and income had any moderating effects on this relationship, so H9a was rejected.

The path coefficient from PV to BI was significant with a small effect size and a small predictive relevance (path coefficient=0.197, t value=3.487, p value=0.001, f^2=0.072, q^2=0.036). Based on these results, H10 was supported. In fact, PV was the third most significant predictor of BI in the model in Jordan. With regard to the moderators' effects, age did not have any moderating effect on this relationship, and gender moderated the relationship, but the effect of PV on BI was stronger among men rather than women. However, income moderated the relationship and the effect of PV on BI was stronger among low income users. Therefore, H10a was partially supported. The results also showed that the relationship between PV and BI was moderated by education such that the effect of PV on BI was stronger among low educated users.

With regard to the relationship between HT and BI, the results showed that HT had a significant effect on BI. The relationship had a small effect size and a small predictive relevance (path coefficient=0.137, t value=3.578, p value=0.000, f^2=0.040, q^2=0.020). Thus, H11 was supported. The results also showed that HT was the second most significant predictor of BI in Jordan's model. With regard to the moderators, age had a moderating effect, but the effect of HT on BI was stronger among younger users rather than older users. Gender did not have any moderating effects. Experience had moderating effects, but the effect of HT on BI was stronger among low experienced users, so H11a was partially supported.

The path coefficient from HT to USE was significant with a small effect size (path coefficient=0.175, t value=2.608, p value=0.009, f^2=0.033). Therefore, H12 was supported. However, age, gender and experience did not have any moderating effects on this relationship so H12a was rejected.

Unlike Iraq's model, the results showed that TC did not have any significant effect on BI in Jordan's model or any effect size or predictive relevance (path coefficient=-0.022, t value=0.657, p value=0.511, f^2=0.001, q^2=0.000). Therefore, H13 was rejected. Accordingly, H13a was rejected, too.

The results showed that CSBV had a significant effect on BI with a small effect size and nearly a small predictive relevance (path coefficient=0.160, t value=2.676, p value=0.008, f^2=0.040, q^2=0.018 (nearly 0.02)). Accordingly, H14 was supported. Interestingly, the results showed that CSBV had a more significant effect on BI than PRA and EE. With regards to the effect of the moderators on this relationship, age and gender did not have any moderating effects. However, experience had moderating effects such that it was more significant for high experienced users. Therefore, H14a was partially supported. One additional moderator was also found to affect this relationship, which was income, as the effect of CSBV on BI was found to be more significant among users with a high income level.

The results showed that ND was the most significant predictor of BI in the model in Jordan with a small (near to medium) effect size and a small predictive relevance (path coefficient=0.306, t value=4.560, p value=0.000, f^2=0.121, q^2=0.057). Therefore, H15 was supported. In fact, ND was also a significant predictor of USE with a small effect size (path coefficient=0.285, t value=2.748, p value=0.006, f^2=0.060). Therefore, H16 was also supported. ND was the second most significant predictor of USE after BI. In terms of the moderating effects on the relationship between ND and BI, age did not moderate the relationship, but gender moderated the relationship such that the effect of ND on BI was stronger among women rather than men, so H15a was partially supported. Furthermore, age and gender did not moderate the relationship between ND and USE, so H16a was rejected.

6.4 UAE Sample Analysis

6.4.1 Response Rate and Non-response Bias

A total of 533 questionnaires were distributed in Dubai, UAE in June and July 2015. The process of collecting the questionnaires from UAE took longer than the collection time period from Iraq and Jordan as people had busy schedules and respondents fluent in Arabic were harder to find. Therefore, the process took nearly two months to be completed. All respondents were mobile users. The visual inspection of the filled questionnaires revealed that 33 questionnaires had a high amount of missing data, with only some sections completed and others left out. These questionnaires were excluded from the research as they were not useful. A total of 437 completed questionnaires were used in analysis of the data collected from UAE. The response rate was 82%.

As with both the Iraqi and Jordanian samples, the Mann-Whitney-U-Test was conducted in SPSS for the early responses (early 50 respondents) and the late responses (last 50 respondents) (having distributed the questionnaires over nearly a two-month period), as shown in Appendix S. The results of the Mann-Whitney-U-Test revealed that there were no significant differences between the early and late responses, as all p values were higher than the threshold value of 0.05 with the lowest p value of 0.120. The results helped to ensure that non-response bias did not exist for the UAE sample.

6.4.2 Respondents' Demographic Profiles and Descriptive Statistics

Respondents were born in different countries. A total of 268 respondents (61.3% of the total number of respondents) were born in UAE. The rest of the respondents were born in other Arab countries, including Egypt 56 respondents (12.8% of the total respondents), Iraq 10 respondents (2.3%), Jordan two respondents (0.5%), Kuwait 30 respondents (6.9%), Lebanon 4 respondents (0.9%), Morocco two respondents (0.5%), Qatar 45 respondents (10.3%) and finally Saudi Arabia 20 respondents (4.6%). In terms of the length of time they had lived in UAE, this varied from three years to 29 years: 60.4% of them had lived in UAE for 18 years or more and 39.6% for less than 18 years. Some of them had lived in UAE since they were born while others were born in other Arab countries but had been living there for some time. However, none of these responses were excluded from the research due to the nature of the population of UAE, having a high number of people from other countries. Furthermore, obtaining information from a resident of a country for three years who is a user of a mobile phone is still considered sufficient to obtain valuable information. Appendix S shows the results of the descriptive statistics for the UAE sample.

In terms of the respondents' age, the sample was distributed almost evenly among the two age groups, 51.7% were aged 18-22 years and 48.3% were aged 23-29 years. In terms of gender, the sample was also split nearly evenly between the two groups: 52.9% were males and 47.1% were females. In terms of education, there was a higher number of respondents with high education levels in the UAE sample than in the Iraqi and Jordanian samples: 11.4% of the respondents had a high school education, 17.6% were at or had a diploma, while a high number of respondents were at the bachelor degree level or bachelor degree holders (55.4%), 7.6% were at a master degree level and finally 8% were at a PhD degree level.

In terms of employment, the highest percentage of respondents were employed (53.3%), followed by students (34.6%). A small percentage of participants were self-employed (5.3%) and a small percentage unemployed and looking for work (5.3%), while only 1.4% were unemployed and not looking for work and only one respondent selected 'other' (0.2%). The annual income level of the respondents was, in general, higher than the income level of those from Iraq and Jordan, which was expected. Only 31.1% of the respondents had an annual income of less than \$10,000, 14.6% had an annual income of \$10,000 to \$19,000, 20.8% had an annual income of \$20,000 to \$29,000 and 21.5% had an annual income of \$30,000 to \$39,000 per year. A smaller number of respondents indicated that their annual income was \$40,000 to \$49,000 (only 4.8% of the respondents) and 7.1% of the respondents had an income of \$50,000 or more per year.

In terms of language fluency level, the descriptive statistics showed that all respondents were able to read, write and speak Arabic fluently. In terms of English language fluency, 89.5% were able to read it easily while 10.5% were not. The majority of the respondents were able to write English easily (85.4%) and 93.6% of them could speak it easily. Only 14.6% of the respondents could not write English easily and 6.4% of them could not speak it easily. In general, the results showed that the respondents' English fluency level was strong in comparison with the respondents from the other two countries.

In terms of the respondents' use of mobile phones, the results revealed that all respondents were users of mobile phones, with a high level of experience, as 68% of them had more than ten years' experience in using mobile phones, 13% less than ten years' experience, and 11.4% less than seven years' experience. Only a small percentage had less than five years' experience (3.9%) and less than three years' experience (3.7%). This showed that the experience level of the respondents from UAE was longer than the experience of the respondents from both Iraq and Jordan in using mobile phones. In terms of mobile phone types, the highest number of respondents were using iPhone (41.2%), followed by Samsung (23.3%) and NOKIA (10.3%). Other respondents used other mobile types including HTC (6.4%), Blackberry (4.6%), HUAWEI (3.7%), LG (3.4%), Sony (2.7%), Lenovo (2.3%) and Motorola (0.2%). Eight respondents did not provide information regarding the type of mobile phone they were using. The results showed that the respondents used mobile applications frequently, including making calls (with a mean value of 5.38 and standard deviation 0.976), mobile apps (mean value 5.26 and standard deviation

0.891), mobile Internet (mean value 6.06 and standard deviation 1.388), mobile social media (mean value 6.02 and standard deviation 1.476), SMS (mean value 5.69 and standard deviation 1.589), mobile email (mean value 5.58 and standard deviation 1.597), and games (mean value 5.37 and standard deviation 1.800). The use of mobile banking and m-commerce was relatively lower than the other applications, with a mean value of 2.56 and standard deviation of 1.543 for mobile banking and a mean value of 2.27 and standard deviation 1.422 for m-commerce, but they were still higher than the values for their use by respondents in the other two countries in the study. The two most frequently used applications of mobile phones by the respondents in UAE were mobile Internet and mobile social media.

The descriptive statistics for the data in Section Three of the questionnaire using the mean, standard deviation and variance showed that the mean value of the Likert scale items ranged between 5.97 and 3.53 and the standard deviation values ranged between 2.31 and 1.36.

The results of the analysis of Section Four of the questionnaire showed that nearly half of the respondents from UAE (47.1%) thought that there are some challenges and problems in mobile phone adoption and usage while 52.9% answered 'No' to this question. The results showed that restriction on mobile services was the main problem, as 26.5% of respondents selected this option. The second problem selected by the respondents was the high prices of mobile phones (24.5%), followed by high prices of mobile Internet (22.4%), market monopoly by the provider (22%), high prices of tariffs by the provider (21.5%), ethical issues (20.4%), bad Internet connection (17.4%), cultural issues (17.6%), lack of regulations (12.1%), and finally poor ICT infrastructure which was the least selected option by the respondents (7.6%); none of them selected ‘Other’.

6.4.3 Data Screening

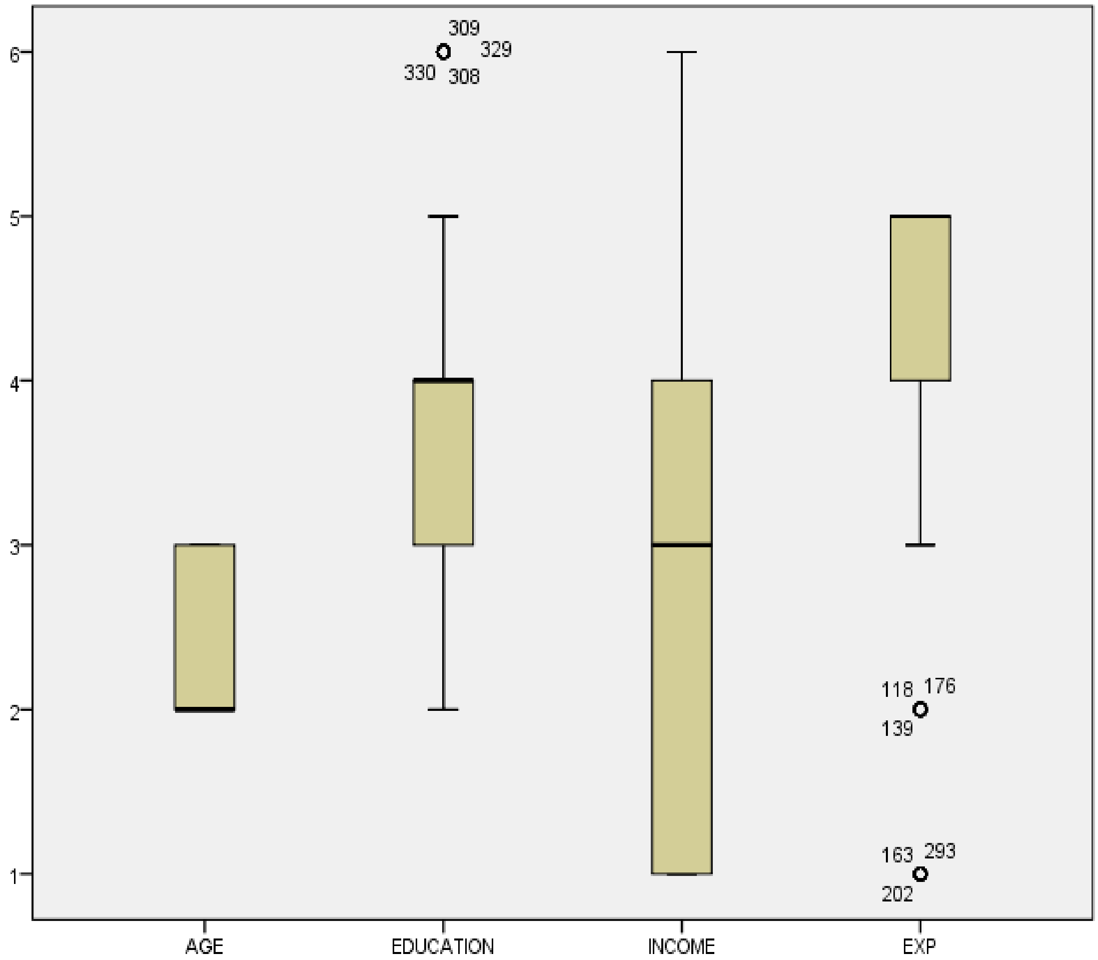
6.4.3.1 Missing Data and Unengaged Responses

Data from UAE’s sample were inspected using Microsoft Excel to detect missing data of more than 10%. The inspection showed that there were 46 cases with a high amount of missing data (more than 10%). These cases were excluded from the research. In terms of unengaged responses, the results showed that 17 respondents selected the same or closely similar answers to all Likert scale items (standard deviation of 0 to 0.41). These cases were also excluded from the research. In addition, the variables were inspected and none of them had more than 2% missing data. These cases were treated using the median value replacement of all responses to the item in SPSS. The final sample size was 437 cases from UAE.

6.4.3.2 Outliers

The assessment of the four demographic variables age, income, education and experience was carried out using box plots in SPSS. The assessment in Figure 6-5 shows that there were no outliers in the age and income variables. The box plots show that there was a total of four outliers in the education variable (cases 308, 309, 329 and 330). The inspection of these outliers showed that these respondents were PhD degree holders aged 23-29 years old with a good level of income, and that level of education was expected to appear in the results, so none of these cases were deleted. There were also a number of outliers in the experience variable. None of them were extreme cases of outliers and these were respondents who had less than five years of experience (cases 118, 139 and 176) and less than three years of experience (cases 163, 202 and 293) in using mobile phones. Again, these cases were not deleted as they formed part of the groups with a low experience level, which was also expected to appear in the responses. Furthermore, the researcher inspected the Likert scale items for univariate outliers using the z-scores in SPSS. The threshold value of the standardised score was ±3. The results showed twelve cases of outliers in which the standardised scores were lower than -3. The Likert scale items were also inspected for multivariate outliers using the Mahalobis Distance D^2 test. Considering the sample size (437 responses), the threshold value of D^2/df of 3 was appropriate. The test for detecting multivariate outliers showed seven cases which were identified as outliers (p value≤ 0.001). The cases were inspected to identify any problems, and the researcher found no problems, as they were still representative of the population and deleting them may risk the chances of generalisability of the findings (Hair et al., 2006). Therefore, these cases were retained for further analysis in the research.

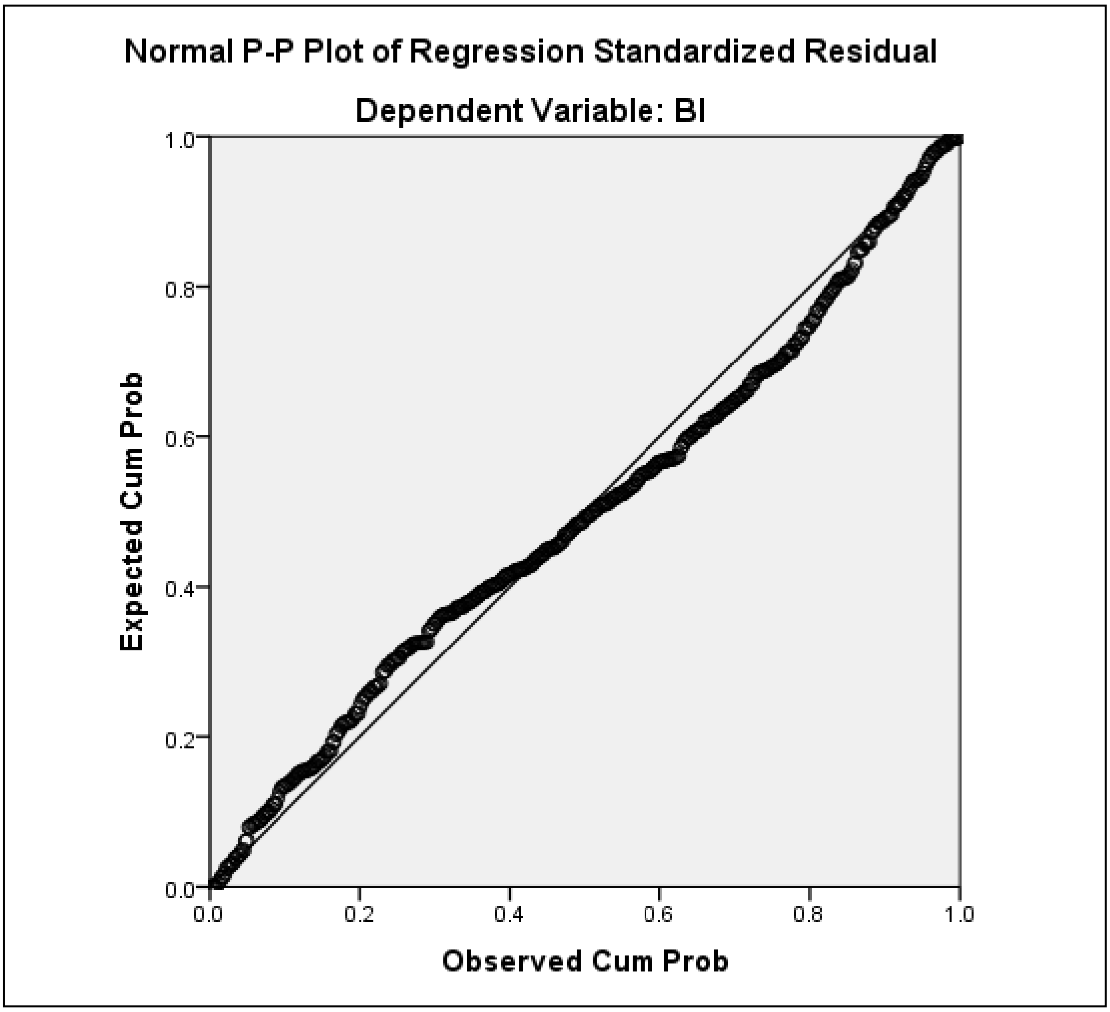
Figure 6-5: Outliers in the Variables ‘Age’, ‘Income’, ‘Education’ and ‘Experience’ for the UAE Sample



6.4.3.3 Normality Tests

As with the Iraqi and Jordanian samples, the normality of the distribution of the data was inspected by assessing the skewness and kurtosis values of the Likert scale items (Appendix S), showing that the values for the items that had skewness issues ranged between -1.762 and -1.012. However, none of them were lower than -2.5. The highest value for kurtosis in the Likert scale items was 2.817 for PRA2. The kurtosis values of those items that had kurtosis issues ranged between -1.637 and 2.817. These values indicated that the data were not normally distributed. This was further supported by the use of a p-p plot for the regression standardised residual. The plot revealed that the data were not normally distributed (Figure 6-6). In general, the amount of data with high skewness and kurtosis from UAE was less than the amount of data with high skewness and kurtosis from Jordan. In addition, the data in the p-p plot were more normally distributed than the data in the Jordanian sample.

Figure 6-6: Normal P-P Plot of Regression Standardised Residual for the UAE Sample



6.4.3.4 Homoscedasticity

As the data had skewness and kurtosis issues, it was expected that homoscedasticity issues would appear, too. The visual inspection of the scatter plots in SPSS revealed that heteroscedasticity existed in the variables, mainly in EE, SI, Enj, PRA and FC. However, the level of heteroscedasticity in the data from UAE was lower than that in the data from Jordan, with no extreme cases found, so no remedies were required. The results showed that the data from UAE were not normally distributed. However, the use of PLS-SEM helped to handle this problem.

6.4.4 Results of Reflective Measurement Model

6.4.4.1 Convergent Validity and Reliability

The AVE values for all reflective constructs were well above the threshold value of 0.50 (as shown in Table 6-31). The AVE values ranged from 0.700 to 0.922. This showed satisfactory results in terms of convergent validity. In addition, the values for Composite Reliability were well above 0.70, ranging from 0.918 to 0.959. Similarly, the values for the Cronbach Alpha were above 0.70, ranging from 0.866 to 0.946. The values for both Composite Reliability and Cronbach Alpha showed a high level of reliability and internal consistency among the reflective constructs for the UAE sample.

Table 6-31: Results of Assessment of Convergent Validity and Reliability for the UAE Sample

	AVE	Cronbach Alpha	Composite
BI	0.802	0.915	0.941
CSBV	0.825	0.894	0.934
EE	0.823	0.946	0.959
Enj	0.922	0.915	0.959
FC	0.700	0.893	0.921
HT	0.789	0.866	0.918
PRA	0.886	0.936	0.959
PV	0.804	0.917	0.942
SI	0.789	0.871	0.918

The results showed that some indicators had loadings lower than 0.70, including Enj1 (0.190), PV5 (0.416), PV6 (0.541), FC6 (0.486) and PRA4 (0.583), so they were deleted. All other items loaded significantly (loadings ranged from 0.761 to 0.961) as shown in Table 6-32.

Table 6-32: Results of Assessment of Convergent Validity-Factor Loadings for the UAE sample

	BI	CSBV	EE	Enj	FC	HT	PRA	PV	SI
BI1	0.761								
BI2	0.948								
BI3	0.940								
BI4	0.919								
CSBV1		0.877							
CSBV2		0.950							
CSBV3		0.897							
EE1			0.916						
EE2			0.941						
EE3			0.940						
EE4			0.897						
EE5			0.839						
Enj2				0.961					

Enj3				0.959					
FC1					0.852				
FC2					0.877				
FC3					0.879				
FC4					0.802				
FC5					0.768				
HT1						0.908			
HT2						0.863			
HT3						0.893			
PRA1							0.933		
PRA2							0.954		
PRA3							0.937		
PV1								0.892	
PV2								0.941	
PV3								0.937	
PV4								0.810	
SI1									0.957
SI2									0.918
SI3									0.780

6.4.4.2 Discriminant Validity

The cross-loadings showed that each construct loaded highly on its own indicators, higher than the loadings on the other constructs' indicators. The results in Table 6-33 show that this was the case in this sample. The results of the Fornell-Larcker Criterion (Table 6-34) showed that the constructs shared more variance with their own indicators than they shared with the other indicators of the other constructs. The correlations of each construct with its indicators were higher than the correlations between the construct and any other constructs in the model.

Table 6-33: Results of Assessment of Discrimininant Validity-Cross-loadings for the UAE sample

	BI	CSBV	EE	Enj	FC	HT	PRA	PV	SI
BI1	**0.761**	0.461	0.521	0.479	0.327	0.466	0.450	0.450	0.138
BI2	**0.948**	0.621	0.661	0.594	0.455	0.678	0.685	0.695	0.070
BI3	**0.940**	0.586	0.621	0.570	0.420	0.665	0.682	0.711	0.082
BI4	**0.919**	0.532	0.583	0.544	0.434	0.613	0.571	0.665	0.071
CSBV1	0.529	**0.877**	0.448	0.361	0.228	0.405	0.331	0.422	0.096
CSBV2	0.600	**0.950**	0.483	0.375	0.253	0.463	0.414	0.564	-0.017
CSBV3	0.553	**0.897**	0.376	0.323	0.178	0.449	0.371	0.597	-0.025
EE1	0.610	0.446	**0.916**	0.428	0.390	0.503	0.490	0.417	0.219
EE2	0.641	0.486	**0.941**	0.423	0.394	0.515	0.508	0.445	0.193
EE3	0.629	0.441	**0.940**	0.433	0.396	0.499	0.495	0.438	0.184
EE4	0.623	0.408	**0.897**	0.421	0.389	0.484	0.443	0.448	0.188
EE5	0.521	0.394	**0.839**	0.389	0.362	0.410	0.481	0.411	0.164
Enj2	0.598	0.379	0.475	**0.961**	0.470	0.551	0.464	0.476	0.114
Enj3	0.578	0.367	0.411	**0.959**	0.477	0.556	0.438	0.435	0.122
FC1	0.336	0.178	0.305	0.334	**0.852**	0.297	0.352	0.243	0.162
FC2	0.318	0.150	0.268	0.325	**0.877**	0.285	0.299	0.228	0.135
FC3	0.453	0.203	0.401	0.429	**0.879**	0.351	0.445	0.297	0.197
FC4	0.416	0.303	0.432	0.504	**0.802**	0.400	0.316	0.318	0.163
FC5	0.365	0.156	0.336	0.434	**0.768**	0.306	0.260	0.190	0.126
HT1	0.642	0.449	0.483	0.528	0.375	**0.908**	0.463	0.527	-0.009
HT2	0.628	0.468	0.572	0.492	0.343	**0.863**	0.495	0.501	0.009
HT3	0.541	0.362	0.347	0.517	0.339	**0.893**	0.425	0.445	0.020
PRA1	0.618	0.399	0.514	0.468	0.386	0.493	**0.933**	0.527	0.148
PRA2	0.617	0.371	0.474	0.423	0.384	0.488	**0.954**	0.530	0.096
PRA3	0.671	0.389	0.514	0.437	0.378	0.491	**0.937**	0.561	0.087
PV1	0.583	0.514	0.453	0.446	0.286	0.463	0.539	**0.892**	-0.045
PV2	0.637	0.534	0.428	0.416	0.293	0.510	0.531	**0.941**	-0.110
PV3	0.727	0.546	0.465	0.452	0.310	0.554	0.581	**0.937**	-0.062
PV4	0.596	0.493	0.355	0.387	0.219	0.455	0.394	**0.810**	-0.159
SI1	0.116	0.021	0.217	0.147	0.188	0.018	0.145	-0.084	**0.957**
SI2	0.065	0.011	0.160	0.100	0.159	-0.006	0.100	-0.116	**0.918**
SI3	0.053	0.010	0.166	0.048	0.155	-0.008	0.025	-0.087	**0.780**

Table 6-34: Results of Assessment of Discrimininant Validity-Fornell-Larcker Criterion for the UAE Sample

	BI	CSBV	EE	Enj	FC	HT	PRA	PV	SI
BI	**0.895**								
CSBV	0.618	**0.908**							
EE	0.669	0.480	**0.907**						
Enj	0.612	0.389	0.462	**0.960**					
FC	0.460	0.242	0.426	0.493	**0.837**				
HT	0.684	0.484	0.533	0.577	0.398	**0.888**			
PRA	0.676	0.411	0.532	0.470	0.406	0.521	**0.941**		
PV	0.713	0.583	0.476	0.475	0.311	0.556	0.574	**0.896**	
SI	0.097	0.017	0.209	0.123	0.191	0.006	0.116	-0.103	**0.888**

The assessment of reliability, convergent validity and discriminant validity for all reflective constructs showed that the reflective measurement model was satisfactory. This enabled the researcher to proceed further with the analysis of the formative measurement model.

6.4.5 Results of Formative Measurement Model

6.4.5.1 Collinearity

The assessment of the tolerance values and VIF values of all formative indicators showed that they were within the normal range, with a VIF value less than 5 and tolerance value higher than 0.20 (Hair et al., 2006). Collinearity was assessed using BI as the dependent variable in linear regression in SPSS. The results displayed in Table 6-35 show that all VIF values of the formative indicators were below the threshold value of 5. There were only two indicators that had a VIF value higher than 3: ND1 (VIF=3.223 and tolerance value=0.310) and ND2 (VIF=3.366 and tolerance value=0.297). The VIF values of the remaining formative indicators ranged from 1.170 to 2.253 and all tolerance values were above 0.20. The results were satisfactory, showing that collinearity was not an issue in the formative measurement model.

Table 6-35: Results of Collinearity Assessment for Formative Indicators in the UAE Sample

	Collinearity			**Collinearity**	
Model	**Tolerance**	**VIF**	**Model**	**Tolerance**	**VIF**
TC1	0.709	1.411	CALLS	0.855	1.170
TC2	0.678	1.475	SMS	0.558	1.794
TC3	0.504	1.985	MOBINT	0.534	1.872
ND1	0.310	3.223	GAMES	0.613	1.632
ND2	0.297	3.366	MOBEMAIL	0.545	1.835
ND3	0.464	2.154	MOBAPPS	0.653	1.532
ND4	0.444	2.253	MOBSM	0.809	1.235
ND5	0.529	1.889	MOBBANK	0.512	1.955
MCOMMERCE	0.500	2.000			

6.4.5.2 Significance and Relevance

The results of the bootstrapping procedure of 5000 samples are displayed in Table 6-36 below.

Table 6-36: Results of Assessment of Outer Weights Significance of Formative Indicators for the UAE Sample

	Outer weights (O)	**Standard error (STERR)**	**T Statistics (|O/STERR|)**	**Signifi-cance level**	**P Values**	**Outer loadings**	**P Values for outer loadings**
CALLS -> USE	**0.097**	**0.059**	**1.651**	**NS**	**0.099**	**0.232**	**0.005**
SMS -> USE	0.281	0.089	3.153	**	0.002	0.761	0.000
GAMES -> USE	**0.016**	**0.090**	**0.174**	**NS**	**0.862**	**0.565**	**0.000**
MCOMMERCE -> USE	**0.021**	**0.065**	**0.325**	**NS**	**0.745**	**0.258**	**0.000**

MOBAPPS -> USE	**0.040**	**0.062**	**0.651**	**NS**	**0.516**	**0.265**	**0.000**
MOBBANK -> USE	**-0.029**	**0.073**	**0.399**	**NS**	**0.690**	**0.241**	**0.001**
MOBEMAIL -> USE	0.369	0.072	5.116	***	0.000	0.785	0.000
MOBINT -> USE	0.496	0.080	6.202	***	0.000	0.850	0.000
MOBSM -> USE	**0.084**	**0.066**	**1.270**	**NS**	**0.205**	**0.410**	**0.000**
ND1 -> ND	0.437	0.114	3.822	***	0.000	0.912	0.000
ND2 -> ND	0.345	0.103	3.342	***	0.001	0.899	0.000
ND3 -> ND	0.192	0.089	2.171	*	0.030	0.792	0.000
ND4 -> ND	0.217	0.083	2.609	**	0.009	0.573	0.000
ND5 -> ND	**0.029**	**0.070**	**0.418**	**NS**	**0.676**	**0.479**	**0.000**
TC1 -> TC	**-0.067**	**0.080**	**0.833**	**NS**	**0.405**	**0.373**	**0.000**
TC2 -> TC	0.479	0.077	6.216	***	0.000	0.359	0.000
TC3 -> TC	0.958	0.039	24.456	***	0.000	0.890	0.000

* Significance level $p \leq 0.05$. ** Significance level $p \leq 0.01$. *** Significance level $p \leq 0.001$. NS = not significant

The assessment of the indicators' weights and their significance for the formative constructs showed that there were eight formative indicators which had insignificant weights. The decision whether to retain or delete each one of them is discussed below.

CALLS -> USE: The results showed that the outer weight of this formative indicator was insignificant (p value=0.099). In addition, its outer loading was below 0.50 (outer loading=0.232) but the loading was significant (p value=0.005). Since the item loading was significant and removing this item would have severely affected the content validity of the construct 'USE', this indicator was retained.

GAMES -> USE: The weight of this item was insignificant (p value=0.862). However, the outer loading was above 0.50 (0.565). Therefore, it was retained.

MCOMMERCE -> USE: The outer weight was insignificant (p value=0.745). Furthermore, the outer loading was below 0.50 (0.258). However, this loading was significant (p value=0.000), so this item was retained.

MOBAPPS -> USE: The outer weight was insignificant (p value=0.516). The outer loading was below 0.50 (0.265), but this loading was significant (p value=0.000), so it was retained.

MOBBANK -> USE: The outer weight was insignificant (p value=0.690) with an outer loading below 0.50 (0.241), but this loading was significant (p value=0.001). Therefore, this item was retained.

MOBSM -> USE: The outer weight was insignificant (p value=0.205) with an outer loading lower than 0.50 (0.410), but this loading was significant (p value=0.000), so it was retained.

ND5 -> ND: The indicator's weight was insignificant (p value=0.676). However, the outer loading was nearly at the 0.50 level (0.479) and it was significant (p value=0.000). Therefore, it was retained.

TC1 -> TC: The outer weight was insignificant (0.405) and the outer loading was below 0.50 (0.373). However, this loading was significant (p value=0.000). Therefore, it was retained.

Although a number of items had insignificant weight and two had insignificant negative weight values (MOBBANK and TC1), they were retained for the same reasons provided for the Jordanian sample in Section 6.3.5.2.

6.4.6 Assessment of Common Method Bias (CMB)

As with the Iraqi and Jordanian samples, the assessment of CMB was conducted using Harman's test in SPSS. The results showed that with the unrotated factor analysis, the first factor accounted for only 31.108% of the total variance. This was less than 50% and lower than the percentages found for the Iraqi and Jordanian models, indicating that CMB was not an issue for the UAE sample, either, and no further tests were required.

6.4.7 Assessment of Structural Model

6.4.7.1 Assessment of Collinearity for the Structural Model

The assessment was carried out separately for each set of predictors for each part of the structural model (part one: EE, PRA, Enj, HT, PV, CSBV, FC, TC, ND, SI and the dependent variable BI; part two: BI, HT, ND and FC and the dependent variable USE). The results of the collinearity test in SPSS are shown in Table 6-37. All VIF values for both sets were well below the threshold value of 5 and the tolerance values were higher than 0.20 for all predictors. The VIF values of the independent variables with the dependent variable BI ranged from 1.188 to 2.361. In addition, the VIF values of the independent variables with the dependent variable USE ranged from 1.224 to 2.621. Accordingly, it was concluded that collinearity was not a problem in the structural model.

Table 6-37: Results of Collinearity Assessment of the Structural Model for the UAE Sample

Coefficients

Model		Collinearity Statistics	
		Tolerance	VIF
1	TC	.715	1.399
	FC	.627	1.595
	Enj	.566	1.766
	SI	.842	1.188
	PRA	.582	1.717
	EE	.496	2.017
	CSBV	.556	1.800
	ND	.424	2.361
	PV	.426	2.345
	HT	.515	1.940

a. Dependent Variable: BI

Coefficients

Model		Collinearity Statistics	
		Tolerance	VIF
1	FC	.817	1.224
	ND	.443	2.255
	BI	.382	2.621
	HT	.534	1.873

a. Dependent Variable: USE

6.4.7.2 Path Coefficients

The bootstrapping procedure showed that nine paths were significant, thus supporting H3, H4, H5, H9, H10, H11, H14, H15 and H16 (Table 6-38). The final results, including the results of these tests as well as the effect size values and predictive relevance are gathered and discussed in Section 6.4.9.

Table 6-38: Summary of the Direct Hypothesised results for the UAE Sample

	Path Coefficients	**Standard Error**	**t Statistics**	**Significance Levels**	**p Values**
BI -> USE (H3)	0.382	0.093	4.088	***	0.000
PRA -> BI (H4)	0.164	0.049	3.344	***	0.001
EE -> BI (H5)	0.114	0.044	2.594	**	0.010
SI -> BI (H6)	0.007	0.015	0.459	NS	0.646
FC -> BI (H7)	0.029	0.022	1.334	NS	0.183
FC -> USE (H8)	0.051	0.043	1.181	NS	0.238
ENJ -> BI (H9)	0.120	0.030	3.964	***	0.000
PV -> BI (H10)	0.217	0.049	4.377	***	0.000
HT -> BI (H11)	0.133	0.038	3.538	***	0.000
HT -> USE (H12)	0.046	0.044	1.043	NS	0.298
TC -> BI (H13)	-0.043	0.029	1.507	NS	0.132
CSBV -> BI (H14)	0.110	0.035	3.122	**	0.002
ND -> BI (H15)	0.285	0.053	5.343	***	0.000
ND -> USE (H16)	0.292	0.079	3.693	***	0.000

* Significance level $p \leq 0.05$. ** Significance level $p \leq 0.01$. *** Significance level $p \leq 0.001$. NS = not significant

6.4.7.3 Coefficient of Determination R^2

The R^2 value for BI was 0.783, indicating that the model can explain 78% of the variance in BI. The R^2 value for USE was 0.476, indicating that the model can explain 48% of the variance in USE. These results were obtained for the model without the inclusion of the moderators' effects.

6.4.7.4 Effect Size f^2

The results in Table 6-39 showed that most of the relationships had a small effect size, except FC->BI (0.003), FC->USE (0.004), HT->USE (0.002), SI->BI (0.000) and TC->BI (0.005), which did not have any effect size as they were below the threshold value for the small size effect (0.02). The highest f^2 value was for ND->BI (0.133), which was near to the medium effect size value of 0.15. The relationships BI->USE (0.090), CSBV->BI (0.030), EE->BI (0.028), Enj->BI (0.037), HT->BI (0.039), ND->USE (0.067), PRA->BI (0.065) and PV->BI (0.094) had a small effect size, higher than 0.02 but lower than 0.15.

Table 6-39: Results of Assessment of f^2 Effect Size for the UAE Sample Model

	f^2
BI -> USE	0.090
CSBV -> BI	0.030
EE -> BI	0.028
ENJ -> BI	0.037
FC -> BI	0.003
FC -> USE	0.004
HT -> BI	0.039
HT -> USE	0.002
ND -> BI	0.133
ND -> USE	0.067
PRA -> BI	0.065
PV -> BI	0.094
SI -> BI	0.000
TC -> BI	0.005

6.4.7.5 Predictive Relevance Q^2

The blindfolding procedure in SmartPLS was carried out and the default omission distance value of 7 was used as the sample size was 437 responses. The results are shown in Table 6-40. The results showed that only five relationships had a small effect size (q^2), including PRA->BI (0.031), Enj->BI (0.015 (nearly 0.02)), PV->BI (0.044), HT->BI (0.015 (nearly 0.02)) and ND->BI (0.058). The highest q^2 effect size value was for ND->BI.

Table 6-40: Results of Assessment of q^2 Effect Size for the UAE Sample Model

	q2
PRA -> BI	0.031
EE -> BI	0.010
SI -> BI	0.000
FC -> BI	0.000
ENJ -> BI	0.015
PV -> BI	0.044
HT -> BI	0.015
TC -> BI	0.000
CSBV -> BI	0.013
ND -> BI	0.058

6.4.8 Assessing the Moderators' Effects

Age

The age variable was separated into two groups, the 18-22 years respondents 'younger users group', 226 respondents, and the 23-29 years 'older users' group, 211 respondents. The path coefficients per group in SmartPLS are shown for the significant direct paths only. The model was able to explain 80% of the variance in BI (R^2=0.800) and 39% of the variance in USE (R^2=0.394) in USE in the younger users group (Table 6-41). The R^2 value in the older group model for BI was 0.877 (88%) and for USE it was 0.558, indicating that the model can explain 56% of the variance in USE in the older users group. The results showed that there were significant differences between the groups in five paths: CSBV->BI (p value=0.999, the effect of CSBV on BI was stronger among the older users group), EE->BI (p value=0.974, the effect of EE on BI was stronger among the older users group), Enj->BI (p value=0.005, the effect of Enj on BI was stronger among the younger users group), PRA->BI (p value=0.001, the effect of PRA on BI was stronger among the younger users group) and PV->BI (p value=0.999, the effect of PV on BI was stronger among the older users group).

Table 6-41: Summary of the Moderating Effect of Age for the UAE Sample

	R^2 Younger Users	R^2 Older Users
BI	0.800 (80%)	0.877 (88%)
USE	0.394 (39%)	0.558 (56/%)

Hypothesis	**Relationship**	**Subsample (1) Younger Users (18-22) years old**				**Subsample (2) Older users (23-29) years old**				**Path Coefficients-difference**	**p-Value (Younger users) vs Older users)**
		Path Coefficients	**Standard Error**	**t value**	**p value**	**Path Coefficients**	**Standard Error**	**t value**	**p value**		
H14a	**CSBV -> BI**	0.035	0.024	1.464	0.144	0.252	0.082	3.065	0.002	0.217	0.999
H5a	**EE -> BI**	0.044	0.038	1.133	0.258	0.174	0.052	3.368	0.001	0.131	0.974
H9a	**Enj -> BI**	0.147	0.043	3.407	0.001	0.014	0.022	0.612	0.541	0.133	0.005
H11a	**HT -> BI**	0.091	0.047	1.926	0.055	0.136	0.045	3.007	0.003	0.045	0.758
H15a	**ND -> BI**	0.235	0.070	3.342	0.001	0.162	0.061	2.649	0.008	0.074	0.212
H16a	**ND -> USE**	0.300	0.120	2.496	0.013	0.367	0.135	2.724	0.007	0.067	0.641
H4a	**PRA -> BI**	0.426	0.093	4.600	0.000	-0.100	0.046	2.187	0.029	0.526	0.001
H10a	**PV -> BI**	0.149	0.046	3.235	0.001	0.413	0.088	4.667	0.000	0.264	0.999

Gender

There were 231 respondents in the group ‘males’ and 206 respondents in the group ‘females’. The R^2 values for BI and USE for the males group were 0.884 (88%) and 0.490 (49%) respectively (as shown in Table 6-42). In addition, the R^2 values in the females group for BI and USE were 0.805 (81%) and 0.469 (47%) respectively. The results of the PLS-MGA revealed that there were significant differences between males and females in five paths: CSBV->BI (p value=0.028, the effect was stronger amongst the males group), Enj->BI (p value=0.998, the effect was stronger amongst the females group), HT->BI (p value=0.018, the effect was stronger amongst males than females), PRA->BI (p value=1.000, the effect was stronger amongst females than males) and PV->BI (p value=0.000, the effect was stronger amongst males than females).

Table 6-42: Summary of the Moderating Effect of Gender for the UAE Sample

	R^2 Male Users	**R^2 Female Users**
BI	0.884 (88%)	0.805 (81%)
USE	0.490 (49%)	0.469 (47%)

Hypothesis	**Relationship**	**Subsample (1) Male Users**				**Subsample (2) Female users**				**Path Coefficients-difference**	**p-Value (Male users) vs (Female users)**
		Path Coefficients	**Standard Error**	**t value**	**p value**	**Path Coefficients**	**Standard Error**	**t value**	**p value**		
H14a	**CSBV -> BI**	0.189	0.074	2.566	0.011	0.050	0.028	1.776	0.076	0.139	0.028
H5a	**EE -> BI**	0.097	0.049	1.992	0.047	0.121	0.056	2.166	0.031	0.024	0.623
H9a	**Enj -> BI**	0.019	0.022	0.875	0.382	0.160	0.043	3.743	0.000	0.141	0.998
H11a	**HT -> BI**	0.177	0.046	3.805	0.000	0.043	0.039	1.116	0.265	0.133	0.018
H15a	**ND -> BI**	0.199	0.055	3.618	0.000	0.254	0.060	4.249	0.000	0.055	0.748
H16a	**ND -> USE**	0.288	0.161	1.797	0.073	0.351	0.127	2.767	0.006	0.063	0.633
H4a	**PRA -> BI**	-0.111	0.048	2.318	0.021	0.440	0.077	5.706	0.000	0.551	1.000
H10a	**PV -> BI**	0.478	0.097	4.916	0.000	0.137	0.041	3.360	0.001	0.341	0.000

Education

Similarly to the previous samples, education was split into two groups with 'low educated users' including respondents at the diploma level and below (127 respondents) and 'high educated users' including users at the bachelor degree level and above (310 respondents). The R^2 values for BI and USE in the low educated users group model were 0.799 (80%) and 0.727 (73%) respectively (Table 6-43). On the other hand, the R^2 values for BI and USE in the high educated users group model were 0.782 (78%) and 0.395 (40%) respectively. The PLS-MGA results showed that there were no significant differences between the two groups in terms of the effect of EE on BI (p value=0.129).

Table 6-43: Summary of the Moderating Effect of Education for the UAE Sample

	R^2 Low Education level Users	R^2 High Education level Users
BI	0.799 (80%)	0.782 (78%)
USE	0.727 (73%)	0.395 (40%)

Hypothesis	**Relationship**	**Subsample (1) Low Education level**				**Subsample (2) High Education level**				**Path Coefficients -difference**	**p-Value (Low Education) vs (High Education)**
		Path Coefficients	**Standard Error**	**T value**	**p value**	**Path Coefficients**	**Standard Error**	**t value**	**p value**		
H5a	**EE -> BI**	0.212	0.094	2.255	0.025	0.091	0.053	1.736	0.083	0.121	0.129

Income

The income variable was separated into two groups, 'low income users' and 'high income users'. However, the categories included in each of the two groups were different from the previous samples in the study due to the higher income level in UAE and the higher average salary level. The two groups were separated as follows.

Low income users (291 respondents) included respondents with an annual income less than $10,000, $10,000 to $19,000 and $20,000 to $29,000.

High income users (146 respondents) included respondents with an annual income of $30,000 to $39,000, $40,000 to $49,000 and $50,000 or more.

The R^2 values for BI and USE in the low income users group were 0.790 (79%) and 0.537 (54%) respectively. In addition, the R^2 values for BI and USE in the high income users group were 0.795 (80%) and 0.416 (42%) respectively (Table 6-44). The results of the PLS-MGA showed that there were no significant differences between the two groups in any of the hypothesised relationships.

Table 6-44: Summary of the Moderating Effect of Income for the UAE Sample

	R^2 Low Income users	**R^2 High Income users**
BI	0.790 (79%)	0.795 (80%)
USE	0.537 (54%)	0.416 (42%)

Hypothesis	**Relationship**	**Subsample (1) Low Income users**				**Subsample (2) High Income Users**				**Path Coefficients-difference**	**p-Value (Low Income) vs (High Income)**
		Path Coefficients	**Standard Error**	**t value**	**p value**	**Path Coefficients**	**Standard Error**	**t value**	**p value**		
H10a	**PV -> BI**	0.170	0.048	3.528	0.000	0.271	0.106	2.564	0.011	0.101	0.817
H9a	**ENJ -> BI**	0.136	0.039	3.481	0.001	0.103	0.051	2.022	0.044	0.033	0.302

Experience

As with the Iraqi and Jordanian samples, the experience variable was split into two groups, ‘low experienced users’ (less than 3 years to less than 7 years), with 83 respondents and ‘high experienced users’ (less than 10 years and more than 10 years of experience), with 354 respondents. The R^2 values for BI and USE for the low experienced users were 0.919 (92%) and 0.728 (73%) respectively (Table 6-45). These results were surprising, as this was the highest explanatory power for the model among all countries and it was for the low experienced users. On the other hand, the R^2 values for the high experienced users for BI and USE were 0.770 (77%) and 0.420 (42%) respectively. The PLS-MGA results showed that none of the hypothesised relationships were significantly different between the two groups except HT->BI (p value=1.000), as the effect of HT on BI was stronger among highly experienced users. However, the results showed that there were significant differences between the two groups in ND->BI (p value=0.000), which was stronger among the low experienced users and ND->USE (p value=0.044), which was also found to be stronger among the low experienced users.

Table 6-45: Summary of the Moderating Effect of Experience for the UAE Sample

	R^2 Low Experience Users	R^2 High Experience Users
BI	0.919 (92%)	0.770 (77%)
USE	0.728 (73%)	0.420 (42%)

Hypothesis	**Relationship**	**Subsample (1) Low experience users**				**Subsample (2) High experience users**				**Path Coefficients-difference**	**p-Value (Low experience) vs High experience users)**
		Path Coefficients	**Standard Error**	**t value**	**p value**	**Path Coefficients**	**Standard Error**	**t value**	**p value**		
H3a	**BI -> USE**	0.150	0.185	0.813	0.416	0.410	0.090	4.586	0.000	0.260	0.902
H14a	**CSBV -> BI**	0.231	0.134	1.719	0.086	0.056	0.030	1.868	0.062	0.175	0.076
H5a	**EE -> BI**	0.080	0.059	1.355	0.176	0.119	0.056	2.108	0.036	0.039	0.701
H11a	**HT -> BI**	-0.008	0.040	0.187	0.852	0.157	0.042	3.735	0.000	0.164	1.000
H9a	**Enj->BI**	0.087	0.054	1.600	0.110	0.136	0.036	3.808	0.000	0.049	0.775
Other relationships which were also found significant between the groups in the analysis	**ND->BI**	0.596	0.107	5.557	0.000	0.190	0.052	3.680	0.000	0.407	0.000
	ND->USE	0.711	0.245	3.330	0.001	0.289	0.087	2.905	0.004	0.422	0.044

6.4.9 Results of Hypotheses Testing and Final Model

The final results of all hypothesised relationships in the model for the UAE sample are included in this section of the thesis. A summary of the final results is shown in Appendix S), showing whether a hypothesis was supported, partially supported or rejected.

The results from the UAE sample showed that the participants in UAE, in general, had a high level of experience in using mobile phones and were familiar with the different mobile applications. Their use of mobile phones and their applications exceeded the use in both Iraq and Jordan. This was expected, since the level of technological advancement and the availability of technological products to the individual users are high. Therefore, H1 was supported for the UAE sample.

For the UAE sample, the model explained 78% of the variance in BI. Furthermore, the model was able to explain 48% of the variance in USE. This showed that the model had a strong predictive power with nine significant paths and a total of seven predictors which were found to affect BI and two predictors of USE. Therefore, H2 was supported for the UAE sample.

The path coefficient from BI to USE was significant with a small effect size (path coefficient=0.382, t value=4.088, p value=0.000, f^2=0.090). This showed that BI had a significant effect on USE. Thereby, H3 was supported. In fact, BI was the most significant predictor of USE. The results showed that experience did not moderate the relationship between BI and USE. Thus, H3a was rejected.

The path coefficient from PRA to BI was also significant with a small effect size and a small predictive relevance (path coefficient=0.164, t value=3.344, p value=0.001, f^2=0.065, q^2=0.031). Thereby, H4 was supported. Age moderated this relationship such that the relationship was stronger among young users. Gender also had a moderating effect but it was stronger among women rather than men, so H4a was partially supported.

With regards to H5, the results showed that the path coefficient from EE to BI was significant with a small effect size and no predictive relevance (path coefficient=0.114, t value=2.594, p value=0.010, f^2=0.028, q^2=0.010). Therefore, H5 was supported. The results showed that age was a significant moderator such that the relationship was stronger among older users. However, gender, experience and education did not have any moderating effects. Therefore, H5a was partially supported.

The path coefficient from SI to BI was insignificant with no effect size or predictive relevance (path coefficient=0.007, t value=0.459, p value=0.646, f^2=0.000, q^2=0.000). Thus, H6 was rejected, as SI did not have a significant effect on BI. Therefore, H6a was rejected too.

With regard to H7 and H8, the results showed that FC did not have a significant effect on BI or USE. The path coefficient from FC to BI was insignificant with no effect size and no predictive relevance (path coefficient=0.029, t value=1.334, p value=0.183, f^2=0.003, q^2=0.000). Thus, H7 was rejected. In addition, the path coefficient from FC to USE was insignificant with no effect size (path coefficient=0.051, t value=1.181, p value=0.238, f^2=0.004). Based on these results, H8 was also rejected. Accordingly, H7a and H8a were rejected, too.

The path coefficient from Enj to BI was significant with a small effect size and nearly a small predictive relevance (path coefficient=0.120, t value=3.964, p value=0.000, f^2=0.037, q^2=0.015 (approximately 0.02)). These results showed that Enj was a significant predictor of BI. Thus, H9 was supported. In fact, Enj was the third most significant predictor of BI in the UAE sample. In terms of the moderators' effects, age was a significant moderator and the relationship was stronger among younger people. Gender moderated the relationship, too, but the relationship was stronger among women than men. However, experience and income did not have any moderating effects. Therefore, H9a was partially supported.

With regard to H10, the path coefficient from PV to BI was significant with a small effect size and a small predictive relevance (path coefficient=0.217, t value=4.377, p value=0.000, f^2=0.094, q^2=0.044). Thus, H10 was supported. These results further showed that PV was the second most significant predictor of BI in the model. The results also showed that age and gender moderated the relationship. PV was stronger among older users but not among women. Income did not have any moderating effects. Therefore, H10a was partially supported.

The path coefficient from HT to BI was significant with a small effect size and a small predictive relevance (path coefficient=0.133, t value=3.538, p value=0.000, f^2=0.039, q^2=0.015 (nearly 0.02)). Therefore, H11 was supported. In terms of the moderators' effects, age did not have any moderating effect, but gender and experience moderated the relationship, as it was stronger among men and individuals with a high experience level, so H11a was partially supported.

Although HT had a significant effect on BI, it did not have any significant effect on USE. The path coefficient from HT to USE was insignificant with no effect size (path coefficient=0.046, t value=1.043, p value=0.298, f^2=0.002). Thus, H12 was rejected. Accordingly, H12a was also rejected.

The path coefficient from TC to BI was also insignificant with no effect size or any predictive relevance (path coefficient=-0.043, t value=1.507, p value=0.132, f^2=0.005, q^2=0.000). Therefore, H13 was rejected. Accordingly, H13a was rejected, too.

With regard to H14, the path coefficient from CSBV to BI was significant with a small effect size and no predictive relevance (path coefficient=0.110, t value=3.122, p value=0.002, f^2=0.030, q^2=0.013). Therefore, H14 was supported. The results of the hypothesis testing showed that age and gender moderated this relationship, but unlike what was hypothesised, the effect of CSBV on BI was stronger among older individuals and men. Experience did not have any moderating effects. Therefore, H14a was partially supported.

The path coefficient from ND to BI was significant with a small effect size and a small predictive relevance (path coefficient=0.285, t value=5.343, p value=0.000, f^2=0.133, q^2=0.058). Thus, H15 was supported. In fact, these results showed that ND had the most significant effect on BI among all predictors. The results showed that age and gender did not moderate the effect of ND on BI. Thus, H15a was rejected. However, the relationship between ND and BI was moderated by experience, which is an additional finding, such that the effect of ND on BI was stronger among low experienced users.

Finally, the path coefficient from ND to USE was also significant with a small effect size (path coefficient=0.292, t value=3.693, p value=0.000, f^2=0.067). Therefore, H16 was supported. These results also revealed that ND was the second most significant predictor of USE after BI in the UAE model. However, this relationship was not moderated by age or gender. Therefore, H16a was rejected. The relationship between ND and USE was moderated by experience, which is an additional finding, such that the effect of ND on USE was stronger among low experienced users.

6.5 Multigroup Analysis

The PLS-MGA test was used to compare the paths in the three groups in pairs (i.e., UAE vs. Jordan, Jordan vs. Iraq and Iraq vs. UAE). Although some of the statistical power could be lost while carrying out this test for each pair in the three groups separately, it was the most applicable approach. Sarstedt et al. (2011) proposed a new approach to testing the differences among groups simultaneously, mainly due to the lack of software output for this test for more than two groups at the same time. However, Sarstedt et al.'s (2011) approach is still new and is not a well-established approach that can help the researcher to draw reliable conclusions. Therefore, the non-parametric PLS-MGA was used to compare the groups in pairs. The parametric test results, although not taken into consideration, are also shown in Appendix T. Since each sample from each country had been analysed separately already and convergent validity, discriminant validity and reliability had already been established, there was no need to assess the measurement or the structural models for each country separately in the multigroup analysis. Only the differences between the paths in the countries and their significance were considered at this stage of the analysis.

Table 6-46: Results of PLS-MGA (Non-parametric) Test for the Three Countries (Group Comparisons)

Paths	**Path Coefficients-diff (| UAE - JORDAN |)**	**Path Coefficients-diff (| IRAQ - UAE |)**	**Path Coefficients-diff (| IRAQ - JORDAN|)**	**p-Value (UAE vs JORDAN)**	**p-Value (IRAQ vs UAE)**	**p-Value (IRAQ vs JORDAN)**
BI -> USE	0.079	0.049	0.128	0.279	0.363	0.176
CSBV -> BI	0.045	0.014	0.059	0.757	0.595	0.793
EE -> BI	0.009	0.025	0.016	0.541	0.355	0.417
ENJ -> BI	0.026	0.164	0.137	0.274	**1.000**	**0.999**
FC -> BI	0.057	0.070	0.012	0.106	0.939	0.599
FC -> USE	0.018	0.108	0.090	0.416	0.910	0.868
HT -> BI	0.002	0.065	0.063	0.516	0.120	0.121
HT -> USE	0.173	0.219	0.047	**0.976**	**0.010**	0.315
ND -> BI	0.020	0.160	0.180	0.590	**0.990**	**0.990**
ND -> USE	0.001	0.194	0.195	0.504	**0.951**	0.921
PRA -> BI	0.035	0.012	0.022	0.300	0.565	0.368
PV -> BI	0.026	0.092	0.066	0.362	0.905	0.833
SI -> BI	0.026	0.012	0.039	0.215	0.387	0.197
TC -> BI	0.024	0.347	0.323	0.702	**0.999**	**1.000**

The results of the PLS-MGA test (Table 6-46) showed that some of the paths were different among the groups. Mainly, the model in Iraq was different from the other two countries. The results showed that the paths ENJ->BI (p value=1.000), HT->USE (p value=0.010), ND->BI (p value=0.990), ND->USE (p value=0.951) and TC->BI (p value=0.999) were significantly different between the model in Iraq and the model in UAE. In addition, three paths were significantly different between the model in Iraq and the model in Jordan: ENJ->BI (p value=0.999), ND->BI (p value=0.990) and TC->BI (p value=1.000). No paths in the models in Jordan and UAE were significantly different except HT->USE (p value=0.976). While ND was the most significant predictor of BI in both Jordan and UAE, TC was the most significant predictor of BI in the model in Iraq. The paths that were not significantly different among all groups and had strong relationships were CSBV->BI, EE->BI, HT->BI, PRA->BI, PV->BI and BI->USE.

6.6 Conclusion

This chapter presented the results of the analysis of the collected data. The analysis of the data from each country was conducted separately. This research provides an important methodological contribution by analysing the collected data using PLS-SEM, which is consistent with the data analysis method used by Venkatesh et al. (2012) to test UTAUT2. Within the context of the studies conducted in Arab countries on technology adoption and validating UTAUT, PLS-SEM has not been used as widely as CB-SEM, despite the importance of this advanced data analysis method as it allows the estimation of complex relationships in models with latent variables.

The next chapter provides a discussion of the results that were obtained in relation to each country, including the moderators' effects. This is followed by a discussion of the findings from all countries, including the similarities and differences between them and the challenges facing mobile phone adoption and use from young Arabs' perspective.

Chapter Seven : Discussion

7.1 Introduction

This chapter provides a discussion of the results obtained in the previous chapter through analysis of the data collected from each country separately. The effect of each of the factors in the proposed model and the effects of the moderators in the model in Iraq, Jordan and UAE are discussed. Justifications for the significance or insignificance of the relationships proposed in the model in each country are also provided. This is followed by a discussion of the reconceptualisation of the extended UTAUT2 (MPAUM) in the three countries included in the study. This chapter also includes a discussion of the achievement of each of the research objectives that were set in Chapter One in this thesis.

7.2 Discussion of Results from Iraq

7.2.1 Discussion of the Factors

The results in Iraq were generally consistent with UTAUT2 (Venkatesh et al., 2012). BI had a significant effect on USE. In Iraq, as a country that has been through many wars and a severe political situation for many years, TC was the most significant factor. This is consistent with the findings in Straub et al. (2001) and Loch et al.'s (2003) studies. Users in Iraq are seen as 'Isolated users' (Brach, 2010) from the more technologically advanced countries and in their view, being more open to technology advancement is important. TC was followed by HT. The sample included participants who were actual users with a good level of experience in using mobile phones, which enabled them to develop habits. This was followed by PV and ND, which is reasonable, as Iraq is a developing country with limited economic and ICT infrastructure levels. The significance of PV in Iraq can be due to the increase in prices of mobile services in Iraq (because of their high taxation) along with the high unemployment rate amongst young people (GSMA, 2015b). With regard to the significance of ND, the literature illustrated that the technological infrastructure and policymaking in Iraq is behind in comparison to other Arab countries (Sanati, 2005) as there is an absence of regulations and an independent regulatory authority (Best, 2011; Tawfeeq et al., 2014). In the original Cultural Influence Model for Information Technology Transfer, Straub et al. (2001) referred to ITT/System Outcomes as the intention or actual use of technology. Within the context of the research model in Iraq, ND had a significant effect on BI only. A reason for this is that users in Iraq have mostly experienced poor levels of ICT infrastructure and policy environment (Tawfeeq et al., 2014). Even with the slow improvements that have recently taken place in terms of network strength and speed, they have become used to the low level of ICT development while using their mobile phones which affected their views on the significance of ND on USE. Nevertheless, the effect of ND if the country is behind in terms of ICT development can have a negative effect on the users' experience when using a system (i.e., causing an unpleasant experience when using mobile phones).

Consistent with previous studies, for example Davis (1989), Adams et al. (1992), Keil et al. (1995) and Son et al. (2012), PRA was found more significant than EE in the research model in Iraq. PRA and EE were followed by CSBV, which was the least significant factor in the model. The low significance level of CSBV could be due to the late interaction that users in Iraq have had with mobile phones in comparison to other Arab countries (Khayyat and Heshmati, 2012). FC, SI and Enj did not have any significant effects in the model in Iraq. The insignificance of Enj is inconsistent with the findings in previous literature related to technology adoption (e.g., Davis et al., 1992; Nysveen et al., 2005a; Kamel and Farid, 2007; Rao and Troshani, 2007; Khayatt and Heshmati, 2012). However, Iraq scored 17 in terms of indulgence (Geert-Hofstede.com, 2014), which indicates it is a restraint society where people do not allocate much of their time for enjoyment. This could also be due to the unstable political and economic situation that Iraq has been through over the past decade.

7.2.2 The Role of the Moderators

Age Impact

The results contradict the findings of Venkatesh et al.'s (2012) study in which the effect of HT on USE was found to be stronger amongst older users. However, the effect of HT on BI was more significant amongst the older users group, which is consistent with the findings of Venkatesh et al. (2012). The factors TC, CSBV, ND and PRA had higher effects amongst the older users group, while the effect of EE on BI and HT on USE had higher effects amongst the younger users group. These results contradict the hypotheses and the findings in Venkatesh et al.'s (2012) study.

Overall, the results showed that age did not significantly moderate any of the relationships in the research model in Iraq, except the relationship between PV and BI. The results showed that younger users consider PV a more significant predictor of BI than older users do. This contradicts the findings in Venkatesh et al.'s (2012) study in which PV was found to be a more significant factor for older users. However, this finding is consistent with previous studies including Kamel and Farid (2007) and Rao and Troshani (2007), who explained that older people are more likely to adopt mobile services as they earn more. The possible explanation is that Iraqis aged 18-22 years old find PV more important, as they are mostly students who are self-funded and are not in employment. Since most of the results showed that age did not significantly moderate any of the relationships in the model in Iraq and the significance of the factors in the groups were inconsistent with the hypotheses, the researcher investigated the differences between the younger and older users groups by analysing the mean differences between the two groups in the use of different mobile applications (as shown in the table in Appendix Q). The results showed that 1) The differences between the two groups were not high, 2) The older users group's mean values were higher than the younger users' mean values in all mobile phone applications included in the table. This illustrates that older users were actually using mobile phones a little more frequently than the younger users. This could be the reason for the contradicting results with what was originally hypothesised in terms of the effects of age on the model in Iraq, since the original assumption was that older users would use mobile phones less frequently than young users.

Gender Impact

The results showed that gender moderated three relationships in the model: PRA and BI, CSBV and BI and HT and BI. PRA was significantly stronger amongst males than females. Furthermore, CSBV had a significantly stronger effect on BI amongst females than males. In fact, CSBV was the most significant predictor of BI in the model for Iraqi females. While CSBV was the least significant factor (in fact it was insignificant) for males, this factor was the most significant determinant of mobile phone adoption and use for females. This means that females think that technology-mediated meetings are highly important for mobile phone adoption and use. This can be due to the high gender gaps in Iraq, confirmed in previous reports (e.g., GSMA, 2014; European Parliament, 2014). Women are more reserved than men and have fewer opportunities for face-to-face interactions than men do in Iraq. With regard to the moderating effect of gender on the relationship between HT and BI, the results showed that the effect of HT on BI is significantly stronger amongst males than females, consistent with UTAUT2 (Venkatesh et al., 2012). Gender did not significantly moderate the remaining relationships in the model. However, the results did not contradict the hypotheses, as EE was more significant amongst women than men, ND was more significant amongst men than women, PV was stronger amongst women than men and TC was stronger amongst men than women.

Education Impact

The results showed that education did not significantly moderate the relationship between EE and BI. However, the effect of EE was more significant amongst low educated users than high educated users (although the difference was insignificant). This is consistent with the extant literature on the importance of education in technology adoption (e.g., Porter and Donthu, 2006; Göğüş et al., 2012; Khayyat and Heshmati, 2012). Education was found to moderate two additional relationships in the model, which were not included in the hypotheses: CSBV and BI and ND and BI. The effect of CSBV on BI was significantly stronger amongst high educated users. This could be because users with a high education level are usually more familiar with technology (Göğüş et al., 2012) and may use mobile phones more often for technology-mediated meetings. An additional relationship that was also moderated by education was the relationship between ND and BI. Surprisingly, ND was more significant amongst low educated users. A possible explanation is that low educated users tend to have low income levels in general and therefore live in low to middle level areas in the city, which makes them experience issues related to tariffs and bad networks more often than higher educated (and thereby possibly higher income) users who live in high level areas in the city.

Income Impact

The results of the PLS-MGA showed that income did not moderate any of the relationships. The effect of PV on BI however was stronger amongst low income users (although the difference was not significant), which is consistent with the findings of Alwahaishi and Snášel's (2013) study. However, in contrast to what was hypothesised, the effect of TC on BI was stronger amongst low income users, although this factor had a significant effect on BI in the models for both groups. The result was surprising, as users with a higher income level can usually travel and read foreign technology magazines and journals. A possible explanation is that in the views of the low income respondents in Iraq, they may not travel abroad frequently, but based on their perceptions, travelling abroad and reading foreign technology journals would help them to use technology further. Also, there was a limited level of variation in the sample in terms of income, as the majority of the respondents had a low income level and the income level of the high income users was not highly different from the low income group's income level.

Experience Impact

Experience did not significantly moderate any of the relationships. This is inconsistent with the literature (e.g., Taylor and Todd, 1995c; Bajaj and Nidumolu, 1998; Wu and Wang, 2005; Park et al., 2009; Venkatesh et al., 2003, Venkatesh et al., 2012), in which experience was found to have a significant role in technology adoption models. The sample included respondents with various levels of experience (from less than 3 years to more than 10 years) and there were 194 respondents in the low experience level group and 204 respondents in the high experienced users group. This indicated that the insignificant differences between the two groups were not due to issues related to similarities or sample size between the two groups. Another issue was that, contrary to what was hypothesised regarding the significance of the effect of CSBV on BI and HT on USE, they had a stronger effect in the low experienced users groups, while EE had a more significant effect on BI amongst the high experience users group (although none of these differences were significant).

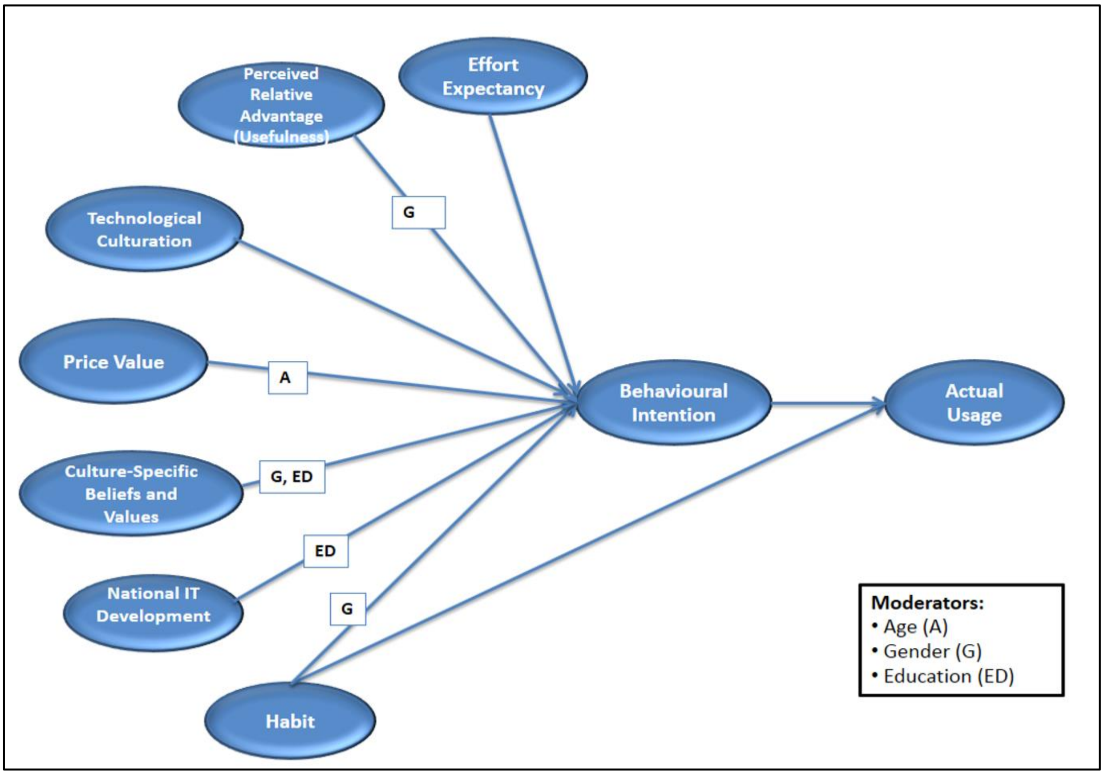
The researcher investigated the possible reasons behind this by analysing the differences between the two groups in terms of the frequency of use of mobile phones and their applications using descriptive statistics. The reason behind this investigation was that although low experienced users have lower experience in terms of the time period they have used mobile phones and their applications, there may not be a significant difference between them and the higher experience group in terms of the frequency of use (i.e., how often they use mobile phones). Consistent with UTAUT2 (Venkatesh et al., 2012), experience was measured in the research model as the length of time for which users have used mobile phones. Venkatesh et al. (2012) illustrated that experience is based on the length of time users have used a system. However, a mobile phone user who has possessed a mobile phone for a period of ten years (for example) does not necessarily have more experience than a user who has been using a mobile phone for five years with a higher frequency of use. The inclusion of frequency of technology use as well as the length of time the system has been used for has been discussed in previous studies (e.g., Salanova and Schaufeli, 2000). Hurtienne et al. (2010) categorised exposure to technology into three parts, including the length of time the technology has been used, frequency of use and diversity of use, which refers to the different functions and services used with the system. The authors further contended that these three parts are not necessarily related to one another and that this exposure has effects on usage. The table in Appendix Q shows that higher experienced users used mobile phones and their applications only slightly more often and the standard deviation values were not completely different, either. The possible explanation behind the insignificant role of experience as a moderator in the model and the inconsistent results regarding the significance of EE, CSBV and HT in the two groups is that since low experienced users used mobile phones nearly as frequently as high experienced users, they developed experience in using mobile phones.

7.2.3 The Final Model in Iraq

The conceptual framework in Iraq is directly linked to the aim and objectives of this research. The main aim was to propose and examine a conceptual model explaining the factors that can predict BI and USE of mobile phones by young Arabs in specific Arab countries. The conceptual framework in Iraq provided support to the viability of the UTAUT2 and its extension. It also included the factors that can predict BI and USE of mobile phones by young Arabs in Iraq. Based on the level of significance of the factors in the model, insights into future trends to mobile companies operating in Iraq are provided (in Chapter eight). The analysis of the literature conducted in this research showed that although the topic of technology acceptance has been investigated and analysed in previous technology adoption theories, there is a gap in the existing technology acceptance theories in terms of the inclusion of factors related to culture and national IT development. The contribution of this research in terms of the model in Iraq lies in the significance of the additional factor TC, being the most significant predictor of BI in the model. In addition, CSBV and ND had a significant effect on BI. The additional moderator 'education' had significant effects in the model in Iraq. The model fills the gap in the literature by integrating factors related to culture and national IT development within the context of mobile phone adoption and use in Iraq.

The model in Iraq is generally consistent with UTAUT2 (Venkatesh et al., 2012), as many of the factors were significant in the model, including EE, PRA, PV, HT and BI. TC, CSBV and ND also had significant effects in the model. Three moderators were significant: age, gender and education. The final model in Iraq can be found in Figure 7-1 below.

Figure 7-1: Final Model in Iraq



The results showed that the proposed model (extended UTAUT2) has the ability to explain mobile phone adoption in Iraq, as most of the factors were significant in the model. Furthermore, the model was able to explain 78% of the variance in BI and 41% of the variance in USE through the direct effects only. These results are acceptable in comparison with the original UTAUT2's explained variance for BI and USE (where the direct effects only explained 44% of BI and 35% of USE). The variance explained in BI was significantly higher in the proposed research model in Iraq than in UTAUT2. The explanatory power of UTAUT2 was 74% of the variance in BI and 52% of the variance in USE with the inclusion of the moderators (interaction terms) in the model (Venkatesh et al., 2012). The explanatory power of the model in Iraq increased in some of the groups during the MGA. Although income was not a significant moderator in the Iraqi model, the explanatory power of the model in Iraq was highest amongst high income users (R^2=0.881 (88%) for BI and R^2=0.581 (58%) for USE) (as shown in the table in Appendix Q). This supports the findings in UTAUT and UTAUT2 in relation to the increasing explanatory power of the model with the inclusion of moderating variables.

7.2.4 Challenges Facing Mobile Phone Adoption in Iraq

37.4% of the participants used iPhone handsets followed by Samsung (34.7%). While these two types of handset are dominant in Iraq, a small number of users had other devices, including Blackberry, General, HTC, Lenovo, LG, Nokia and Sony. This shows that all respondents used smartphones. When the respondents were asked whether there are any challenges facing mobile phone adoption in Iraq, more than half (60.3%) indicated that challenges exist in relation to mobile phone adoption and use. Bad Internet connections followed by a lack of regulations and high prices of mobile Internet, followed by high prices of mobile handsets, then high prices of tariffs then poor ICT infrastructure were the main challenges selected by the Iraqi respondents. This is consistent with the literature in relation to the ICT infrastructure and 3G networks in Iraq, which were only launched in 2015, alongside the poor network infrastructure (Khayyat and Heshmati, 2012; Khayyat and Heshmati, 2013; Tawfeeq et al., 2014). The selection of these challenges by the Iraqi respondents is a clear indication of the poor ICT infrastructure and inefficient policymaking. Previous reports related to the ICT sector in Iraq highlighted that the lack of an effective regulatory environment, as well as an absence of a truly independent regulatory authority in Iraq (Best, 2011; Khayyat and Heshmati, 2012; Khayyat and Heshmati, 2013; Tawfeeq et al., 2014), including the absence of regulations related to service prices in Kurdistan and the rest of Iraq and the sector being ruled by the Ministry of Communications since 2013. In addition, the severe political situation and the wars the country has been through have certainly had an effect on the operations of the telecommunication companies and their pricing strategies (International Telecommunication Union, 2013), in addition to forcing additional taxes on mobiles and mobile Internet. Culturally and ethically related challenges were less selected than the challenges related to ICT infrastructure and regulations. However, these two issues are also related to ICT policies and regulations to control for any unethical behaviour that may take place. The restrictions on mobile services option in Section Four of the questionnaire was the least selected option, which indicates that this is not a major issue in Iraq.

7.3 Discussion of Results from Jordan

7.3.1 Discussion of the Factors

The most significant predictor in the model was ND. This significance is consistent with Straub et al. (2001) and Loch et al.'s (2003) studies. The strong effect ND had on BI indicates that Jordanians are aware of the importance of the ICT development in mobile phone adoption. HT was the second most significant predictor of BI in the model, since Jordanians have a high experience level in using mobile phones which made users build habits towards BI and USE of mobile phones. The third most significant predictor of BI was PV, which was expected due to the increase in prices of mobile phones and mobile services in Jordan since 2013 (GSMA, 2015a) and the high unemployment rate in Jordan which affects affordability (GSMA, 2015a). The results also showed that young Jordanians enjoy using mobile phones and that Enj is a significant predictor of BI. This is consistent with the findings of Davis et al. (1992), Nysveen et al. (2005a), Kamel and Farid (2007) and Rao and Troshani (2007). It is also consistent with the nature of the society in Jordan, as it scored 43 in terms of 'Indulgence' (Geert-Hofstede, 2014).

CSBV was also a significant predictor in the model, which demonstrates that young Jordanians have a preference for technology-mediated meetings and that the emphasis on face-to-face meetings which was referred to by Rose and Straub (1998), Hill et al. (1998) and Straub et al. (2001) has changed (or at least decreased). PRA (usefulness) and EE have been found to be significant in the majority of the studies of technology acceptance (e.g., Davis, 1989; Adams et al., 1992; Keil et al., 1995; Son et al., 2012). However, within the model in Jordan, these two factors were the least significant predictors of BI. Nevertheless, PRA was more significant than EE, which is consistent with those studies. Three constructs were found to be insignificant in the model in Jordan: SI, FC and TC. The insignificance of TC is inconsistent with the findings in Straub et al. (2001) and Loch et al.'s (2003) studies. A possible reason behind this could be that the Jordanian telecommunication market is open and the country has privatised the incumbent operator and international companies are investing in it (Hakim and Neaime, 2014). This is consistent with Brach's (2010) categorisation of users in Jordan as 'Integrated Users', as they are more open to technology than isolated users. Examination of the relationship between BI and USE showed that BI had a significant effect on USE in the model in Jordan.

7.3.2 The Role of the Moderators

Age Impact

Overall, the results showed that age was only a significant moderator for two relationships: EE and BI and HT and BI. The effect of EE on BI was stronger amongst older users. This is consistent with what was hypothesised and consistent with the findings of Venkatesh et al.'s (2012) study. The effect of HT on BI was more significant amongst younger users. This is inconsistent with the findings of Venkatesh et al. (2012). In addition, although age did not significantly moderate the relationship between HT and USE, the effect of HT on USE was stronger amongst the younger users group. The remaining relationships in the research model in Jordan were not significantly moderated by age. However, the effect of CSBV on BI, Enj on BI and PRA on BI were more significant amongst younger users, while the effect of PV on BI was stronger amongst older users. Contrary to what was hypothesised, the effects of ND on both BI and USE were stronger amongst older users. Originally, the reason behind hypothesising that the effect of ND on BI would be stronger amongst younger users was that younger people use technology more often than older people (Alkhunaizan and Love, 2012). The researcher, therefore, investigated the differences between the two groups in the sample in terms of use of mobile phones to see whether it is higher amongst the younger users group. As shown in the table in Appendix R, the differences between the younger and older users in terms of the use of mobile phone applications were not high. Furthermore, the mean value for using some of the mobile applications, including making calls, m-email, mobile apps, mobile banking and m-commerce, were slightly higher amongst the older users group. The possible explanation for the unexpected results in terms of the higher significance ND had on BI and USE amongst the older users group is that the older users (aged 23-29 years old) also used mobile phones and their applications extensively, even more than the younger users in some of these applications.

Gender Impact

The results show that gender only significantly moderated three relationships in the model in Jordan: ND and BI, PRA and BI and PV and BI. First, the results showed that gender moderated the relationship between ND and BI. However, this effect was more significant amongst females rather than males. Similarly, the effect of ND on USE, although insignificantly moderated by gender, was higher amongst the females group. Second, as hypothesised, gender significantly moderated the relationship between PRA and BI, such that the effect was stronger amongst males. This is consistent with the findings of Venkatesh and Morris (2000), Venkatesh et al. (2003) and Venkatesh et al. (2012). Third, gender significantly moderated the relationship between PV and BI. While PV was significant amongst males, it was insignificant amongst females. A reason behind this is that, as found in the literature, in general the male is the main responsible person in the Arab family and he provides the financial funds (Kirdar, 2010), and a lower number of women in the Arab countries work outside the home (Elborgh-Woytek et al., 2013). The remaining relationships in the model were not significantly moderated by gender. In contrast to Venkatesh et al.'s (2012) study, the effect of HT on USE was only significant in the model for the females group and the effect of Enj on BI was also higher amongst the females group. However, consistent with the hypotheses, the effects of CSBV on BI and EE on BI were more significant amongst women and the effect of HT on BI was more significant amongst men.

Education Impact

The results showed that education significantly moderated the relationship between EE and BI. However, the effect of EE on BI was only significant amongst highly educated users. This finding was inconsistent with the results of the research conducted by Porter and Donthu (2006), which found that high educated users find technologies easy to use compared to low educated users. A possible explanation for this is that highly educated users may require more sophisticated tasks from their mobile phones. When highly educated people use sophisticated tasks on their mobile phones, ease of use becomes more important. Another important additional finding was that education significantly moderated the relationship between PV and BI, such that the effect of PV on BI was more significant amongst low educated users. A logical explanation for this is that low educated users tend to have low income, which makes them pay more attention to price value.

Income Impact

Income significantly moderated the relationship between PV and BI, such that the effect of PV on BI was stronger amongst low income users. This is consistent with the hypothesised effect of income on the relationship between PV and BI. It is also consistent with the findings of Alwahaishi and Snášel (2013). Although income did not significantly moderate the relationship between Enj and BI, it was more significant amongst higher income users, which is consistent with what was hypothesised. An additional finding in relation to the moderating effect of income in the Jordanian sample was that income significantly moderated the relationship between CSBV and

BI. CSBV was insignificant for low income users but it was significant for high income users. A possible explanation for this is that as the higher income users work and are more exposed to technology, find technology-mediated meetings less time-consuming and therefore have higher preferences for them.

Experience Impact

The findings indicated that the effects of CSBV on BI and HT on USE were more significant amongst higher experience users, which is consistent with what was hypothesised. However, the effect of HT on BI was significant amongst the low experienced users group but not in the high experienced group. Following the same argument provided in Section 7.2.2 for the effect of experience in the Iraqi model regarding looking into experience from the frequency of use aspect as well as the time period mobile phones have been used for, the table in Appendix R was created. The table shows that there were no significant differences between the low experience and high experience groups in terms of frequency of use. In fact, the low experienced users had slightly higher means of frequency of use in mobile Internet, games and mobile email, which may have led them to develop habits.

The third relationship which was significantly moderated by experience was PRA and BI, as PRA was significant amongst the low experienced users group but insignificant amongst the high experienced users group. The similarities in terms of the frequency of use of mobile phones and their applications between the two groups could mean that although the respondents have a low experience level in terms of the number of years they have used mobile phones for, because they use mobile phones frequently, they have been able to gain experience and, therefore, PRA has become significant to them. In addition, experience did not moderate the relationship between EE and BI;

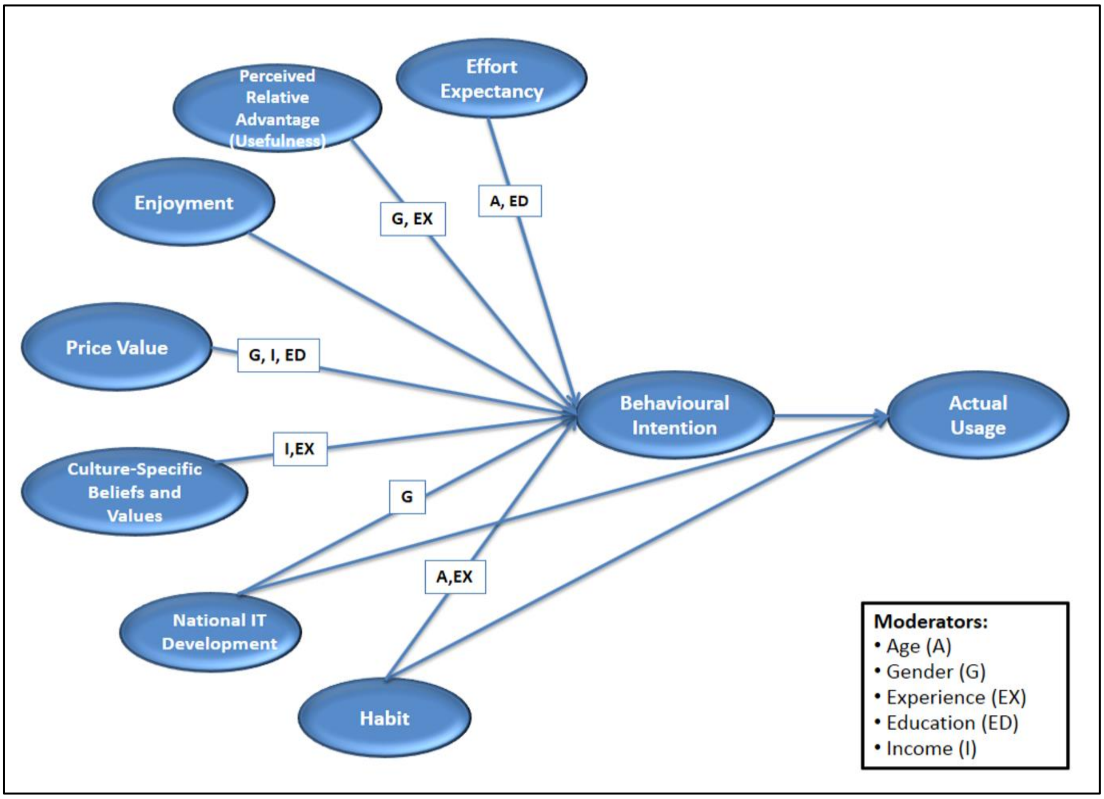
although the effect of EE on BI was slightly higher amongst the higher experience users, the difference between the two groups in terms of this relationship was minor. The relationships between BI and USE and Enj and BI were not significantly moderated by experience. The effects of BI on USE and Enj on BI were stronger amongst low experienced users, consistent with UTAUT2 (Venkatesh et al., 2012).

7.3.3 Final Model in Jordan

The conceptual framework in Jordan is directly linked to the aim and objectives of this research. The main aim was to propose and examine a conceptual model explaining the factors that can predict BI and USE of mobile phones by young Arabs in specific Arab countries. The conceptual framework in Jordan provided support for the viability of the UTAUT2 (Venkatesh et al., 2012) and extended it by including factors related to culture and national IT development. It included the factors that can predict BI and USE of mobile phones by young Arabs in Jordan. Based on the level of significance of the factors in the model, insights into future trends are provided to mobile companies in Jordan (in Chapter eight). The literature review conducted in this research showed that different technology acceptance theories exist but there is a gap in them in terms of the inclusion of factors related to culture and national IT development. The contribution of this research in terms of the model in Jordan lies in the significance of the additional factor ND, being the most significant factor in the model. Also, CSBV was significant in the model. In addition, the two proposed moderators including income and education had significant moderating effects in the model. The model fills the gap in the literature by integrating factors related to culture and national IT development within the context of mobile phone adoption and use in Jordan.

The model in Jordan generally confirms the applicability of extended UTAUT2 (Venkatesh et al., 2012), as a high number of the predictors proved to be significant, including PRA, EE, PV, Enj, HT and BI. Furthermore, the additional constructs ND and CSBV were found significant, while TC, FC and SI were not significant in the model. All moderators had significant moderating effects in the model: age, gender, education, income and experience. The final model in Jordan can be found in Figure 7-2 below.

Figure 7-2: Final Model in Jordan



The results showed that the proposed model is able to explain mobile phone adoption in Jordan. The model was able to explain 78% of the variance in BI and 51% in USE. The explanatory power of the model in Jordan in terms of USE was the highest among all of the models for the three countries. The variance-explained values for BI and USE in the model in Jordan are also significantly higher than the explanatory power of UTAUT2. The effects of some of the moderators improved the explanatory power of the model. The explanatory power of BI in the model in Jordan was highest amongst high experienced users (R^2 for BI 0.853 (85%) and R^2 for USE 0.560 (56%)) (as shown in the table in Appendix R), while the highest explanatory power for USE was amongst the low educated users group (R^2 for BI 0.834 (83%) and R^2 for USE 0.590 (59%)).

7.3.4 Challenges Facing Mobile Phone Adoption in Jordan

The findings revealed that most of the participants used Samsung phones, followed by iPhone then HUAWEI. A small number of participants used other mobile handsets, including HTC, Nokia, LG, Nokia, Note3 and Sony. Only 38% of them indicated that challenges exist in relation to mobile phone adoption and use. Bad Internet connection was the highest selected challenge. This was a surprising result, since 4G networks were launched in Jordan in 2015 (www.orange.jo, 2015). This could be related to respondents living in poor areas in Amman where the network connection may not be strong. The policies introduced in 2013 with regard to tax increases resulted in a significant increase in prices of mobile phones and services (GSMA, 2015a). Some of the participants who agreed on the existence of the challenges facing mobile phone adoption in Jordan selected high prices of mobile handsets, mobile Internet and mobile tariffs. This was followed by ethical issues related to mobile use. Poor ICT infrastructure was selected by 17.5% of the respondents. This was followed by lack of regulations, cultural issues, market monopoly then restriction on mobile applications. The literature showed that within the Arab countries, there are a number of ethical issues associated with the use of mobile phones; for example secret relationships (Hameededdin, 2010) or taking pictures without people’s consent (Kamel and Farid, 2007; Ibahrine, 2009). The findings indicated that 18.4% of the participants selected the ethical issues option and 14.9% of the participants selected the cultural issues option. The participants are concerned about ethical and cultural issues as well as issues related to ICT infrastructure and the regulatory environment.

7.4. Discussion of Results from UAE

7.4.1 Discussion of the Factors

The most significant predictor of BI was ND, which is consistent with Straub et al. (2001) and Loch et al.'s (2003) studies, as both suggested that ND is important for technology adoption. This shows that mobile phone users in UAE are aware of the importance of the development of ICT on their mobile phone adoption and use. UAE is the most technologically advanced among the Arab countries (Alfaki and Ahmed, 2013), although previous studies have shown that the country is not advanced in terms of developing ICT policies and creating real competition in the market (Alfaki and Ahmed, 2013).

PV was the second most significant predictor of BI, which is consistent with UTAUT2 (Venkatesh et al., 2012). Although UAE is a rich country and the income level is higher than other Arab countries, the participants still found PV to be an important factor affecting mobile phones use. The effect of PV was more important than cultural values in the model in UAE. This is consistent with Kalba (2008), who found that price is more important than cultural effects in developing countries. This also shows that even when users are on a high level of income, the prices of mobile phones and mobile Internet are still important. Young users in UAE found Enj important for mobile phone adoption and use, which is consistent with the findings of previous studies (Davis et al., 1992; Kamel and Farid, 2007; Rao and Troshani, 2007). SI, TC and FC were not significant in the model in UAE. CSBV was more significant than EE in the model in UAE but less significant than PRA. Straub et al. (2001) found that CSBV (in terms of sense of time) was more significant than TC. In the model in UAE, CSBV was significant, while TC had an insignificant effect in the model. The insignificance of TC is inconsistent with what was previously found in Straub et al. (2001) and Loch et al.'s (2003) studies. The reason for TC's insignificant effect on BI could be that young users in UAE are already open and exposed to the more advanced countries. The categorisation in Brach's (2010) study of users in UAE as 'Consumers' provides further support and validates this argument. PRA and EE were found to be significant factors in the model. USE was only influenced by BI and ND. EE was the least significant factor predicting BI in the model.

The results show that the effect of HT on USE was indirect only, through BI. Venkatesh et al. (2012) adopted a similar approach to Limayem et al.'s (2007) approach in including HT in a technology adoption model. Limayem et al. (2007) explained that in order for people to develop habits, two conditions have to be satisfied: 1) Repeating the action (on a weekly basis at a minimum), 2) A stable environment in which the action is repeated. For the respondents in Dubai, the first condition was met, but not the second. Young Arabs in UAE use mobile phones regularly and many of them own more than one mobile phone. The descriptive statistics showed that the respondents mostly 'strongly agreed' and 'agreed' to the items related to HT (see Appendix S). Limayem et al. (2007) explained that changes in environment or the context in which the action takes place can stop the direct effect of HT on USE, and BI comes into play in this case. Venkatesh et al. (2012) contended that the technological environment surrounding users is constantly changing, with the example of how smartphones extend the use of basic mobile phones from just making phone calls to using different applications and the camera. The authors further concluded that although the technological environment is constantly changing, users still developed HT towards USE directly and mediated (via BI) in UTAUT2. However, the findings in this research indicated that within a rapidly changing technological environment (such as the one in Dubai/UAE) and especially amongst young Arab users, the effect of HT becomes conceptualised as stored intention towards USE of mobile phones. This is consistent with the argument provided by Limayem et al. (2007). It is worth noting that the participants in this research in general were young users, which makes them less affected by habit (Venkatesh et al., 2012).

7.4.2 The Role of the Moderators

Age Impact

Age significantly moderated five relationships: CSBV and BI, EE and BI, Enj and BI, PRA and BI and PV and BI. Consistent with what was hypothesised, the relationships between EE and BI and PV and BI were more significant amongst older users and Enj and BI and PRA and BI were more significant amongst younger users. This is also consistent with UTAUT2 (Venkatesh et al., 2012). However, the effect of CSBV on BI was more significant amongst older users. This is inconsistent with what was hypothesised originally in the research. Age did not significantly moderate the relationships between HT and BI, ND and BI and ND and USE. The effect of HT on BI was stronger amongst older users and the effect of ND on BI was stronger amongst younger users, although not significantly different. These effects were consistent with the hypotheses. Surprisingly, the effect of ND on USE was more significant amongst older users. An explanation behind this is that older users, although they used mobile applications slightly less than younger users, were also using their mobile phones extensively (as shown in the table in Appendix S). Thus, they had a good understanding of the effect of ND on USE. It is important to note that the effect of ND on BI was significant amongst the older users group, too (although less significant than for the younger users group).

Gender Impact

Gender moderated five relationships in the model in UAE: CSBV and BI, Enj and BI, HT and BI, PRA and BI and PV and BI. The relationship between HT and BI was more significant amongst males than females, which is consistent with the hypothesis and UTAUT2 (Venkatesh et al., 2012). PRA was more significant amongst females than males and the difference between the two groups in terms of PRA was significant. This contradicts with what was hypothesised and UTAUT2 (Venkatesh et al., 2012). The effect of PV on BI was more significant amongst males than females. The possible explanation for this result is that the Arab male is usually the main responsible person who provides financial help to the family (Kirdar, 2010), although, women's participation rate in the labour force is high in UAE in comparison to the other Arab countries (European Parliament, 2014). The effects of CSBV on BI was only significant amongst males, unlike the relationships between Enj and BI, ND and BI and ND and USE, which were more significant amongst females. These results contradict what was hypothesised. Consistent with what was hypothesised, the effect of EE on BI was stronger amongst females (although the difference was not significant between the two groups).

Education Impact

The results showed that education did not significantly moderate the relationship between EE and BI. However, consistent with the hypothesis, the effect of EE on BI was stronger amongst the low educated users group. This confirms what was found in the literature on the importance of education in technology adoption (e.g., Porter and Donthu, 2006; Göğüş et al., 2012; Khayyat and Heshmati, 2012).

Income Impact

Income did not moderate any of the two hypothesised relationships. However, the effect of PV on BI was more significant amongst low income users, which is consistent with what was hypothesised and Alwahaishi and Snášel's (2013) study, although the difference between the two groups was insignificant. The effect of Enj on BI was also more significant amongst the low income users group, which is inconsistent with what was hypothesised. Nevertheless, both groups were generally on a high income level and Enj was significant amongst both groups.

Experience Impact

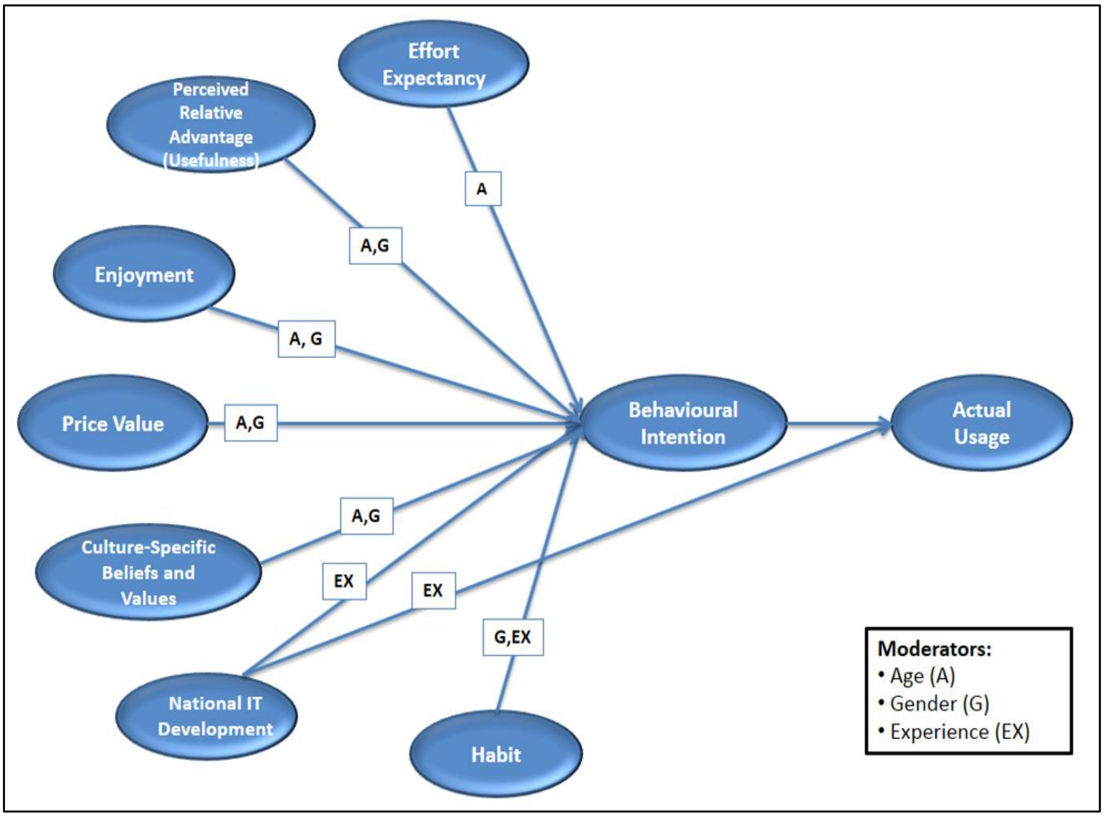
Experience moderated only one relationship amongst all the hypothesised relationships. The relationship between HT and BI was stronger amongst the high experienced users and the differences between the two groups were significant. This is consistent with UTAUT2 (Venkatesh et al., 2012). The remaining relationships were not significantly moderated by experience. Consistent with the hypothesis, the effect of CSBV on BI was stronger amongst high experienced users. On the contrary to what was hypothesised, the effect of BI on USE was only significant amongst the high experienced users group, just like the effects of EE on BI and Enj on BI, which were more significant amongst the high experienced users group. Two additional relationships were found to be significantly moderated by experience: ND and BI and ND and USE. The effect of ND on BI and the effect of ND on USE were stronger amongst low experienced users. These results are generally inconsistent with the hypotheses and UTAUT2 (Venkatesh et al., 2012). The reason behind this may have been the large difference in the sample size between the two groups related to experience. Furthermore, the table in Appendix S shows that both groups used mobile phones applications extensively, which makes it difficult to differentiate between them.

7.4.3 Final Model in UAE

The main aim of this research was to propose and examine a conceptual model explaining the factors that can predict BI and USE of mobile phones by young Arabs in specific Arab countries. The conceptual framework in UAE is directly linked to the aim and objectives of this research. It provided support for the viability of the UTAUT2 and extended it by integrating factors related to culture and national IT development. The model included the factors that can predict BI and USE of mobile phones by young Arabs in UAE. Based on the significance of the factors in the model in UAE, insights into future trends are provided to mobile companies in UAE. The analysis of the literature conducted in this research showed that there is a gap in the existing technology adoption theories in terms the inclusion of factors related to culture and national IT development. The contribution of this research in terms of the model in UAE lies in the significance of ND being the most significant factor in the model. Additionally, CSBV had significant effects on BI. The model fills the gap in the literature by integrating factors related to culture and national IT development within the context of mobile phone adoption and use in UAE.

The results show that the model in UAE is generally consistent with extended UTAUT2 (Venkatesh et al., 2012), as the variables ND, PV, Enj, HT, PRA, CSBV, EE and BI were significant. The moderators age, gender and experience had significant moderating effects in the model. The final model in UAE can be found in Figure 7-3 below.

Figure 7-3: Final Model in UAE



The model was able to explain mobile phone adoption in UAE. The model was able to explain 78% of BI and 48% of USE without the moderators' effects (as discussed in Section 6.4.7.3), which is higher than the explanatory power of UTAUT2. Although the only moderators that were found to be significant for the model in UAE were age, gender and experience, the effects of the moderators in general improved the explanatory power in the model, which is consistent with UTAUT (Venkatesh et al., 2003) and UTAUT2 (Venkatesh et al. 2012). The table in Appendix S shows that the moderators had an important role in improving the explanatory power of the model. The highest explanatory power was amongst the low experienced users group (bearing in mind that the sample size in this group was low (83 respondents) in comparison with the high experienced users group). The second highest explanatory powers for the model were in males (R^2=0.884 (88%)) for BI and the low educated users group (R^2=0.727 (73%)) for USE.

7.4.4 Challenges Facing Mobile Phone Adoption in UAE

The results showed that a high percentage of the participants were using iPhones, followed by Samsung. Small percentages of the users were using other types of mobile handset, including Nokia, HTC, Blackberry, HUAWEI, LG, Sony and Lenovo, with one respondent using Motorola. When participants were asked whether they think that there are any challenges facing mobile phone adoption and use in UAE, nearly half of them (47%) agreed that challenges exist. The highest number of them selected restrictions on mobile services as one of the main challenges facing mobile phone adoption. Market monopoly was also one of the main challenges selected by participants.

Previous reports showed that there is no freedom of information in UAE (Freedomhouse, 2013) and that restrictions are in place on Voice Over Internet Protocol (VOIP) applications to maintain the control of the two main companies (du and Etisalat) which are owned (directly and indirectly) by the government (Freedomhouse, 2013). This has also been confirmed in previous reports (Freedomhouse, 2013; 2015). The two telecommunication companies have restricted access to many mobile phone applications, including Skype and Viber. FaceTime was also disabled in iPhones in UAE by Apple as part of their deal with the telecommunication companies in UAE (Freedomhouse, 2015). However, in June 2015, Etisalat decided to allow 20% of its shares to be owned by foreign investors

(Freedomhouse, 2015). Only a small number of respondents selected poor ICT infrastructure, followed by lack of regulations.

The results in this research showed that many respondents who come from UAE and other Arab countries (but are resident in Dubai) found that the high prices of mobile tariffs, high prices of mobile phones and high prices of the Internet are challenges facing mobile phone use. Surprisingly, some of the respondents selected bad network as a challenge, too, even though UAE has already launched a 4G network which is fast and available to users there (GSMA, 2015b). A slightly higher number of respondents selected ethical issues than cultural issues.

7.5 Factors that can Influence Mobile Phone Adoption and Use in the Three Countries

The findings of this research indicate that within the context of Arab consumers' mobile phone adoption, cultural values play a significant role in predicting BI. The research included two cultural-related constructs that apply to the Arab consumer: TC and CSBV. TC was found important in Iraq but not in Jordan and UAE. This could mean that TC is important when users are based in an Arab country that is less technologically advanced and less open for more advanced countries or foreign companies to operate in. In addition, the results showed that CSBV, which in this research referred to Arabs' preference for face-to-face meetings vs. technology-mediated meetings (Straub et al., 2001; Loch et al., 2003), was found to be significant in the case of young Arab users' adoption of mobile phones, as it had a strong effect on BI in all of the studied countries. Previous studies have shown that Arabs prefer face-to-face meetings (Rose and Straub, 1998; Hill et al., 1998; Straub et al., 2001). Within the context of mobile phone use, this finding indicated that young Arabs do not object to technology-mediated meetings in all three countries. The findings of this research indicated that the inclusion of cultural factors related to the Arab consumer in an Arab country and the specific technology under investigation is important even for young consumers, who seem to be more influenced by the integration of technology in their daily life.

The research provided new findings regarding the effect of SI on BI towards mobile adoption and use. SI was not a significant predictor in the model in any of the three countries included in the study. This is inconsistent with what was found in many previous theories related to technology acceptance, including TPB (Ajzen, 1991); MPCU (Thompson et al., 1991; Thompson et al., 1994), SCT (Bandura, 1986; Compeau and Higgins, 1995a), DTPB (Taylor and Todd, 1995b), DoI (Rogers, 2003), MOPTAM (Van Biljon and Kotze, 2008), UTAUT (Venkatesh et al., 2003) and UTAUT2 (Venkatesh et al., 2012). This factor was expected to have a significant effect on BI due to the collectivistic nature of the Arab culture (Hofstede, 2001). This indicates that a cultural shift may have taken place in terms of collectivism and that the culture may have moved more towards individualism, as new technologies have helped users to adopt new modern cultural values (as found in ASDA'A Burson-Marsteller, 2014) in relation to mobile phone adoption and use. Alternatively, it could be that SI is important in mandatory settings but not in voluntary settings (Venkatesh and Davis, 2000). In addition, the insignificance of SI within the context of mobile phone adoption could be due to the high level of experience users have and the high level of awareness of this technology, since it is the most widely used technology product in Arab countries.

FC and SI were not found to be significant predictors of neither BI nor USE in the research model in Iraq, Jordan and UAE. This is consistent with the findings in Al-

Qeisi et al.'s (2015) study, which was conducted in Jordan, Egypt and Saudi Arabia. Based on the findings of Venkatesh et al. (2012) in UTAUT2, the effect of FC becomes more apparent amongst older participants with a low level of experience. The target sample and the participants included in this research were young users who were already mobile phone users with a good level of experience.

The insignificance of FC is inconsistent with the findings of previous theories on the significance of PBC and FC in system adoption and use, including TPB (Ajzen, 1991), DTPB (Taylor and Todd, 1995b), A-TAM (Taylor and Todd, 1995c), DoI (Rogers, 2003), MOPTAM (Van Biljon and Kotze, 2008), UTAUT (Venkatesh et al., 2003) and UTAUT2 (Venkatesh et al., 2012). The effect of FC can be overridden by the presence of EE in the model (Venkatesh et al., 2003). With reference to Dwivedi et al.'s (2011) findings, the results of this study indicated that for Arab users' mobile phone adoption, FC had no significant effect on either BI or USE.

While FC had no significant effect, ND was a significant determinant of BI towards mobile phone use. This indicates that ND is relevant to the case of young users' adoption of mobile phones in Arab countries. Furthermore, as the research was conducted in Arab countries where the level of ICT development is generally behind, in comparison to the developed countries, and following the studies conducted by Straub et al. (2001) and Loch et al. (2003), ND was included as a predictor of USE too. While ND had a significant effect on USE in Jordan and UAE, it did not have any significant effect on USE in Iraq. In addition, ND was the most significant predictor of BI in Jordan and UAE, while TC was the most significant predictor of BI in Iraq. The effect of ND on BI remained strong and significant in all three countries despite the high differences between them in terms of ICT infrastructure and policies.

Enj was originally 'Hedonic Motivation' in Venkatesh et al.'s (2012) study. The findings with regards to Enj were varied amongst the three countries. While Enj was a significant predictor of BI towards mobile use in both Jordan and UAE, it was not found to be significant in the model in Iraq. Given the type of society in Iraq, being low in indulgence in terms of Hofstede's cultural dimensions, and the political situation, which can affect young people's perceptions towards enjoyment, this result was found to be reasonable. Both Enj and PRA were found to be important in the model in Jordan and UAE. This is consistent with the Motivational Model (Davis et al., 1992), where both intrinsic motivation and extrinsic motivation were found to be required for technology adoption. However, unlike Igbaria et al. (1996) and Teo et al.'s (1999) studies, in which usefulness was found to be more important than enjoyment, the findings of this research indicated that enjoyment is more important than usefulness in UAE and Jordan. This may be due to the specific nature of the sample in the research which was young Arabs. Enj has a higher effect on BI amongst young users (Venkatesh et al., 2012).

In this research, PRA (usefulness) was significant in the model in all three countries This is consistent with previous technology acceptance theories including SCT (Bandura, 1986; Compeau and Higgins, 1995a), TAM (Davis, 1989), MPCU (Thompson et al., 1991; Thompson et al., 1994), A-TAM (Taylor and Todd, 1995c), DTPB (Taylor and Todd, 1995b), TAM2 (Venkatesh and Davis, 2000), DoI (Rogers, 2003), MOPTAM (Van Biljon and Kotze, 2008), UTAUT (Venkatesh et al., 2003) and UTAUT2 (Venkatesh et al., 2012).

Consistent with TAM (Davis, 1989), MPCU (Thompson et al., 1991; Thompson et al., 1994), A-TAM (Taylor and Todd, 1995c), DTPB (Taylor and Todd, 1995b), TAM2 (Venkatesh and Davis, 2000), DoI (Rogers, 2003) and MOPTAM (Van Biljon and

Kotze, 2008), EE was found to be significant in the model in all three countries. Hence, this finding is consistent with these previous theories. The findings of this research from all three countries showed that the effect of EE has become less significant for Arab mobile phone users. This could be due to the increasing level of experience they have gained from using these devices. Previous studies explained that the effect of EE tends to decrease when users develop experience in using technology systems as they become more familiar with how to use the technology (mobile phones) (e.g., Davis et al., 1989; Igbaria et al., 1997; Karahanna and Straub, 1999; Wu and Wang, 2005). Furthermore, the effect of EE tends to be lower amongst young users (Venkatesh et al., 2003; Venkatesh et al., 2012). The sample in this study generally included the younger users segment of the population (18-29 years old). Therefore, EE did not have a highly significant effect on BI in comparison to the other significant factors in the model.

Although PRA and EE were significant predictors of BI, they were not the most significant factors in the model in the three countries. These two factors were also found in TAM (Davis, 1989) and they were widely used to study technology adoption. They had both proved to be highly significant in previous studies (as discussed in Section 2.2.3). The results showed that the inclusion of other factors more related to young Arabs in Arab countries, in terms of culture and ICT development, overrides the importance of PRA and EE amongst actual users with good experience level in using mobile phones. This stresses the importance of ICT infrastructure and cultural-related factors in mobile phone adoption and use when developing or extending existing models in Arab countries. In contrast to Al-Qeisi et al.'s (2015) findings, the results of this research showed that EE was the least significant factor in the model in Jordan and UAE, and its significance was weak in comparison to the other factors in the model in Iraq. This could be due to the differences in the technology being investigated, as Arab users have more experience in using mobile phones in general in comparison to Internet banking. Moreover, the respondents in this research are generally young.

PV was found to be highly significant in the model in all three countries despite the differences between them in terms of the economic development level. This shows that the young Arab participants have high consideration for the value or benefits they can obtain from using mobile phones and mobile services in comparison to the price they have to pay. This is consistent with UTAUT2 (Venkatesh et al., 2012). In fact, PV proved to be significant amongst Arab users in general, whether they were on a high income level (i.e., users in UAE) or a low income level (i.e., users in Jordan and Iraq).

The literature review showed that the prices of mobile Internet are affected by many issues, including increasing openness and competition in the mobile market (Varoudakis and Rossoto, 2004), efficient spectrum band harmonisation (GSMA, 2013; Gelvanovska et al., 2014) and implementing effective pricing policies and regulations. This confirms the findings of previous studies, which emphasised the importance of price for the adoption of ICTs and mobile phones and services (e.g., Kalba, 2008; Alrawabdeh et al., 2012; Alkhunaizan and Love, 2012; Abu-Shanab and Abu-Baker, 2014; Hakim and Neaime, 2014), especially after the economic crisis and the Arab Spring with the accompanying decrease in income levels (Khandelwal and Roitman, 2013).

BI had a significant effect on USE in the model in all three countries. This confirms what was found in previous TA theories including TRA (Fishbein and Ajzen, 1975), TAM (Davis, 1989), TPB (Ajzen, 1991), DTPB (Taylor and Todd, 1995b), A-TAM (Taylor and Todd, 1995c), TAM2 (Venkatesh and Davis, 2000), MOPTAM (Van Biljon and Kotze, 2008), UTAUT (Venkatesh et al., 2003) and UTAUT2 (Venkatesh et al., 2012). The previous literature showed that BI is not the only predictor of USE (e.g., Limayem et al., 2007), as HT also has a significant effect on USE. In this research, three predictors of USE were included in the model. Consistent with UTAUT2 (Venkatesh et al., 2012), HT was included as an additional predictor of USE. In all three countries, BI was the most significant predictor of USE. While HT had a significant direct effect on USE in Iraq and Jordan, the effect of HT on USE was indirect (through BI) in UAE. HT only had a direct significant effect on USE in the model in Iraq and Jordan. The presence of a stable environment is important to develop habit that can directly affect use (Limayem et al., 2007). Users in Iraq and Jordan have certainly had a lower amount of changes in the environment in terms of mobile phones and new technologies than users in Dubai/UAE.

7.6 MPAUM (Extended UTAUT2) Model Fit

The findings indicated that the Mobile Phone Acceptance and Use Model (MPAUM) fits well in Iraq, Jordan and UAE and provides a valid extension of UTAUT2 (Venkatesh et al., 2012), although it fits differently in the three countries (as some variables were significant in some countries but not others), indicating that national differences affect the model's fit even within the Arab region. SI and FC, which were part of UTAUT and UTAUT2, were insignificant in all three countries. The items that were removed from the constructs in the model were different in the three countries. This further confirms that the model fits differently in the three countries, but it has an acceptable explanatory power in all of the countries studied. Nevertheless, the model is found to be culturally bound, as it fits differently in each country. Arab countries in general and the studied countries in particular, although having a certain level of similarity, are different in terms of their social, cultural, economic, political and ICT infrastructures. This makes the possibilities of developing a single generalised model that can fit in the same way in the three countries fairly limited. Nevertheless, most of the factors in the proposed model were significant in all three countries (except SI and FC which were insignificant in all three countries, Enj which was insignificant in Iraq and TC which was insignificant in both Jordan and UAE). The factors PRA, EE, ND, HT, PV, CSBV and BI were significant in all three countries. UTAUT2 is successfully applicable to the three Arab countries, although at different levels and with different combinations of variables in the model. This research also provided an extension to this theory with the inclusion of ND, which was significant among all countries. CSBV was also significant among all countries, as it is closely related to the nature of the culture in the Arab countries, and TC was the most significant factor which affected BI in Iraq but not in the other two countries.

The effects of the moderators on the relationships in the model in each of the three countries were limited in comparison to UTAUT2. This is consistent with Al-Qeisi et al.'s (2015) research, in which the moderators had no real significant effects on UTAUT in Egypt, Jordan and Saudi Arabia. In this research, age and gender were significant moderators in the model in all three countries, although their effects on the relationships in the model were not as significant as originally anticipated.

Education was only a significant moderator in the model in Iraq and Jordan. It is important to note that while respondents in UAE had a good command of English, respondents in Jordan and Iraq had a significantly lower ability to use this language. This indicates a need for the inclusion of Arabic content along with English in newly developed mobile applications in these countries. Income did not moderate any of the relationships in the model in Iraq and UAE. Experience was only significant in the model in Jordan and UAE. Jordan was the only country where all moderators were significant in the model. In general, the results in terms of the effects of the moderators on the relationships in the model in the three countries were inconsistent. However, the inclusion of the moderators and understanding their effects in each country increases the explanatory power of the model in each country. Furthermore, it allows the individual consumer's needs to be addressed, to further understand the differences between consumers, which adds more value in terms of the contributions of this research.

The model's explanatory power was acceptable in all three countries and improved further with the inclusion of the moderators (in the different groups). The explanatory power of the proposed model exceeded the explanatory power of UTAUT2 in the direct paths only and when the effects of the moderators were considered and included in each of the three countries as well. The UTAUT2's explained variance for BI and USE (where the direct effects only explained 44% of BI and 35% of USE). The explanatory power of UTAUT2 was 74% of the variance in BI and 52% of the variance in USE with the inclusion of the moderators (interaction terms) in the model (Venkatesh et al., 2012). In this research, the model in Iraq was able to explain 78% of the variance in BI and 41% of the variance in USE through the direct effects only. The explanatory power of the model in Iraq was highest amongst high income users (R^2=0.881 (88%) for BI and R^2=0.581 (58%) for USE). The model in Jordan was able to explain 78% of the variance in BI and 51% in USE. The explanatory power of BI in the model in Jordan was highest amongst high experienced users (R^2 for BI 0.853 (85%) and R^2 for USE 0.560 (56%)), while the highest explanatory power for USE was amongst the low educated users group (R^2 for BI 0.834 (83%) and R^2 for USE

0.590 (59%)). The model in UAE was able to explain 78% of BI and 48% of USE without the moderators' effects. The explanatory powers for the model amongst males was R^2=0.884 (88%) for BI and the low educated users group was R^2=0.727 (73%) for USE.The model had the highest explanatory power (direct effects only) in Jordan. The fact that the model had an acceptable explanatory power in three Arab countries which are different shows that the model is robust in terms of mobile phone adoption and use and that it provides a valid extension of UTAUT2 within the context of these countries.

7.7 Achievement of the Research Objectives

This section provides a discussion of the achievement of each of the research objectives which were set in Chapter One of the thesis.

The research examined the viability of the UTAUT2 model developed by Venkatesh et al. (2012) and extended it within the context of mobile phone adoption in Arab countries, namely Iraq, Jordan and UAE. The research extended UTAUT2 by including factors related to the cultural attributes associated with the adoption and use of mobile phones by Arabs and a factor related to IT development at a national level in relation to mobile phone adoption and use. The extended UTAUT2 fitted differently in the three countries included in the study, indicating that national differences affect the model's fit and that one generalised model that can fit in the exact same way in the three Arab countries cannot be reached. The model can be seen as culturally bound even within the context of Arab countries. Nevertheless, the extended UTAUT2 proved to be applicable in Iraq, Jordan and UAE and had an acceptable explanatory power in all three countries.

Most of the factors included in the model were significant (although at different levels) in the three countries, except for Social Influence and Facilitating Conditions, which were insignificant in all three countries. The extension of UTAUT2 in this research represents an important contribution to the field of IS adoption. National IT Development was a highly significant factor in the model in all three countries. Technological Culturation was the most significant factor in the model in Iraq, although it was insignificant in the model in the other two countries. The construct Culture-Specific Beliefs and Values was also significant in all three countries. The effects of the moderators were inconsistent in the model in the three countries.

This research provided an analysis of the factors that can affect young Arabs' adoption and use of the latest generation of mobile phones, smartphones, in Iraq, Jordan and UAE. In Iraq, Technological Culturation was the most significant factor affecting Behavioural Intention, followed by Habit then Price Value, National IT Development, Perceived Relative Advantage, Effort Expectancy then Culture-Specific Beliefs and Values, while Behavioural Intention and Habit had significant effects on the Actual Use of mobile phones but National IT Development did not. In Jordan, National IT Development was the most significant factor affecting Behavioural Intention in the model, followed by Habit, then Price Value, Enjoyment, Culture-Specific Beliefs and Values, Perceived Relative Advantage then Effort Expectancy. Behavioural Intention, Habit and National IT Development had significant effects on the Actual Use of mobile phones. In UAE, National IT Development was the most significant factor affecting Behavioural Intention towards the use of mobile phones, followed by Price Value then Enjoyment, Habit, Perceived Relative Advantage, Culture-Specific Beliefs and Values then Effort Expectancy. Behavioural Intention and National IT Development were predictors of the Actual Use of mobile phones in UAE. Facilitating

Conditions and Social Influence did not have any significant effects in the model in any of the three countries.

This research examined young Arab customers' perceptions of the obstacles facing mobile phone adoption and use in Iraq, Jordan and UAE. From the perspective of young Arabs in Iraq, bad Internet connection is a major issue, followed by the lack of regulations and the high prices of mobile handsets, mobile tariffs and mobile Internet. The poor ICT infrastructure was also a challenge selected by the participants in Iraq. The cultural and ethical issues associated with the use of mobile phones were the least selected issues in Iraq. The results of this research revealed that bad Internet connections is a challenge facing mobile phone adoption and use in Jordan, followed by high prices of mobile handsets, mobile Internet and mobile tariffs and ethical issues. Poor ICT infrastructure and the lack of regulations, cultural issues and market monopoly were also issues facing the use of mobile phone adoption and use in Jordan. This was followed by restrictions on mobile services. From the perspective of young Arabs in UAE, restrictions on mobile applications is a major issue followed by the high prices of mobile tariffs, mobile handsets and mobile Internet and market monopoly. Cultural and ethical issues were less selected by the respondents in UAE, as were poor ICT infrastructure and the lack of regulations.

This research provided insights into future trends in mobile phone adoption and use for companies currently investing or willing to invest in technology in these countries. The model in each country can be used by mobile companies, handset manufacturers and mobile applications developers to understand the factors that are important to the individual young Arab customer within the context of mobile phone adoption and use. The importance of enjoyment in both UAE and Jordan means that mobile applications developers can develop more mobile gaming applications which could be successful in these countries. Furthermore, the inclusion of Arabic content in mobile applications is still important in Iraq and Jordan. The results regarding the effects of demographic factors, especially gender, can be used by telecommunication companies to address gender gaps in Iraq, Jordan and UAE, especially Iraq, which has the highest gender gap among all Arab countries. Addressing these gender differences is important, since mobile phones can help women to become more economically independent. Furthermore, removing restrictions on some mobile applications such as Skype, Viber, WhatsApp and FaceTime is certainly crucial in UAE.

Another major area which was found to be important in the three countries included in the study was the requirement of reduction of prices of mobile handsets, mobile Internet and mobile tariffs, which the literature showed is closely related to ICT policies in these countries, for example, the high taxation policies in Jordan and Iraq. There is also a need for mobile companies to work on improving network speed and efficiency. In addition, the high significance of technological culturation in Iraq in relation to the use of mobile phones indicates a need for companies in Iraq to be more open to more technologically advanced countries and foreign companies to provide training and events to make young Iraqis aware of the advancements in mobile technologies that are available. This could help mobile companies in Iraq to overcome the high loss of profit they have experienced recently. In addition, despite the recent studies conducted in the areas of mobile banking and m-commerce in different Arab countries, the results of this research revealed that there is still a need for further research to be conducted to identify the reasons behind the lack of use of these mobile services in Iraq, Jordan and UAE and how they can be enhanced.

In conclusion, this cross-cultural/national research extended and confirmed the applicability of UTAUT2 in three Arab countries, namely Iraq, Jordan and UAE, by integrating factors related to culture and national IT development within the context of mobile phone adoption and use in Arab countries. However, the proposed model is culturally bound and fits differently in each of the three Arab countries up to a certain level, indicating that national differences must be taken into consideration even when research is conducted in the Arab region. This research extended knowledge on technology acceptance theories, which is important for academics and IS adoption researchers. Furthermore, the research provided important insights from the young customers' perspective, who form the largest segment of the Arab population. These insights can assist mobile companies in the region to enhance customer satisfaction and use better targeting techniques to recover the loss of profit they have experienced in the last few years, especially in Iraq and Jordan. This research highlighted important issues that need to be taken into consideration by policymakers operating in these countries.

7.8 Conclusion

This chapter provided a discussion of the results obtained in this research from the three countries included in the study. It covered the significance of the main factors in the proposed model, the moderators and how the model fits in these countries. Furthermore, a discussion of the challenges facing mobile phone adoption and use in each of the three countries from the perspective of young Arabs was provided. This chapter also included a discussion with regard to the achievement of each of the research objectives that were set in Chapter One in this thesis. The next chapter builds on this chapter and concludes the research by outlining this research's contribution to knowledge, limitations and future work.

Chapter Eight : Conclusion

8.1 Introduction

The primary aim of this research was to propose and examine a conceptual model explaining the factors that can predict Behavioural Intention and the Actual Use of mobile phones, more specifically the new generation of mobile phones, smartphones, by young Arabs in Arab countries, namely, Iraq, Jordan and UAE. To achieve this aim, a list of objectives was developed: 1) To examine the viability of the UTAUT2 model and extend it within the context of mobile phone adoption and use in Arab countries, namely Iraq, Jordan and UAE; 2) To analyse the factors that affect young Arabs' mobile phone adoption and use in Arab countries, namely Iraq, Jordan and UAE; 3) To examine young Arab customers' perceptions of the obstacles facing mobile phone adoption and use in Iraq, Jordan and UAE; 4) To provide insights into future trends in mobile phone adoption and use for companies currently investing or willing to invest in technology in these countries. In order to achieve these objectives, the following research strategy was used.

An analysis of the most established and well-known technology acceptance models and theories was conducted in Chapter Two. In order to understand the topic of mobile phone adoption and use within the context of Arab countries then the three countries included in this study, an analysis of the literature related to this topic was conducted in Chapter Three. Chapter Four built on the analysis of the literature conducted in Chapters Two and Three to develop the conceptual framework for mobile phone adoption and use in Arab countries and presented the main predictors of Behavioural Intention and Actual Use within the conceptual framework, along with the inclusion of the moderating variables. The gap in the literature was addressed by proposing this conceptual framework. Based on the work conducted in the previous chapters, Chapter Five included the selected methodology and research method. The epistemological perspective of this research was positivism, while the ontological stance was objectivism. Hence, the methodology undertaken was based on the deductive approach to test the conceptual framework. Consistent with what was used in most of the existing literature on IS adoption found in Chapters Two and Three, the research used questionnaires. A total of 533 questionnaires were distributed in major cities to young Arabs aged 18-29 years old in each of Iraq, Jordan and UAE. Chapter Six implemented the methodology in practice. The analysis was conducted separately for each country, followed by a multigroup analysis. The results of testing the hypotheses set in Chapter Four were provided in Chapter Six for each country. Chapter Seven discussed the findings from Chapter Six in relation to the research objectives and the literature.

This chapter concludes the research by providing the contribution to knowledge, which is divided into three sections to illustrate this research's contributions, including theoretical contributions, methodological contributions and practical implications. This chapter also includes the limitations of this research and directions for future research.

8.2 Contribution to Knowledge

This research provides a number of contributions. These contributions are categorised into theoretical, methodological and practical contributions, and each is discussed below.

8.2.1 Theoretical Contributions

Extension of IS Adoption Literature

This research proposes a model that allows a better understanding of the factors that can affect mobile phone adoption and use in Iraq, Jordan and UAE. This research contributes by filling a gap in the literature through conducting cross-cultural/national research within the context of the Arab region. Furthermore, this research extends knowledge on the applicability of an extended UTAUT2 across different countries within the Arab region. The literature review in Section 2.2.10 showed that only a few cross-cultural studies have tested UTAUT within the Arab region, outside it or comparing one of the Arab countries to another developed non-Arab country, for example, Al-Qeisi (2009), Dwivedi et al. (2015) and Al-Qeisi et al. (2015). This research addressed the lack of cross-cultural studies in the body of the technology adoption literature in developing countries (more specifically Arab countries) by studying more than one country separately then providing the general findings from all countries included in the study.

This study provides evidence for the ongoing debate in the literature about how appropriate it is to apply models of technology acceptance that were originally developed from a western perspective in a non-western context (Straub et al., 1997; McCoy et al., 2007). It provides a new outlook in reconceptualising as well as operationalising the UTAUT2 model within the context of mobile phone adoption and use in three Arab countries which form a different region from the developed countries by integrating three new variables into the model: Technological Culturation (TC), Culture-Specific Beliefs and Values (CSBV) and National IT Development (ND), originally found in Straub et al. (2001) and Loch et al.'s (2003) studies, as independent variables and two new moderators, income and education. This study provides evidence of the validity of the proposed extended UTAUT2 within three Arab countries. It can be concluded that this study extends UTAUT2 in an Arabian context and provides evidence of the robustness of the new model (MPAUM) in more than one Arab country.

Extension of IS Adoption Literature in Arab Countries

This is the first cross-cultural/national research that includes three Arab countries to test extended UTAUT (UTAUT2) within the context of mobile phone adoption. It also develops an understanding of the extent of differences in cultural backgrounds within Arab countries and the inclusion of culture-related factors that are specific to the technology being investigated rather than simply the inclusion of Hofstede's cultural dimensions. These dimensions provide a good background on the culture in a certain country, but not necessary the only cultural factors that can be included in models related to technology adoption. The present research empirically examined the factors affecting mobile phone adoption (including the handset and its applications as part of the experience young Arab users have when using mobile phones). This approach allowed for a detailed and deeper understanding of the factors that can affect or encourage mobile phone adoption in these countries. The cross-cultural/national nature of the study within the Arab region allows further understanding of the differences and similarities between them. The three Arab countries included in this research have different political, social, economic and moreover technological situations, which helped to give good insights on the current state of mobile phone (smartphone) adoption and use in the Arab region. It also confirms the validity and possibly generalisability of extended UTAUT2 in the context of mobile phone adoption in the Arab countries exemplified by Iraq, Jordan and UAE. The extended model based on the results obtained in each country was presented in Figures 7.1, 7.2 and 7.3 which represent the reconceptualisation of the model in each country. The reconceptualisation and extensions of UTAUT2 in Iraq, Jordan and UAE is an important contribution of this research, as it extends knowledge in terms of understanding how the model fits in different countries in the Arab region within the context of mobile phone adoption and use.

This research provides a comprehensive validation of extended UTAUT2 with a broader scope within the Arab countries. It provides evidence that there are differences between young users in the different Arab countries. It is also important for researchers to understand how viable it is to include constructs related to ICT infrastructure and policies in relation to the technology they are investigating. The findings of this study advocate the importance of including factors related to national IT development. In fact, the high significance of this factor remained consistent in the model among all three countries. This indicates that this factor remains important, whether in a country that is considered technologically behind (Iraq) or technologically advanced (UAE). This factor was more significant than PRA and EE in all three countries.

This research provides new information to researchers intending to study the adoption of mobile applications in general, in addition to understanding the adoption of the mobile phone as a whole in the three studied countries. This research was concerned with identifying the factors that can affect the adoption of the new generation of mobile phones (smartphones), including making calls and other mobile applications as part of the user’s experience. The analysis of the literature concerning technology adoption in Arab countries showed that most of the previous studies that tested UTAUT concentrated on one mobile phone application/service (as found in Appendix A). Williams et al. (2015) recommended the inclusion of more than one single task when investigating technology adoption and testing UTAUT. It is important to conduct research that includes the mobile handset and its applications in order to understand how the new generation of mobile phones as a whole are adopted and used and to begin to understand how applications are adopted, as their use is interlinked in various aspects. The adoption and use of the mobile handset can be affected by the mobile applications that can be accessed through it by the individual user and vice versa. Moreover, the adoption and use of different mobile applications and services, for example mobile messaging applications, mobile banking and m-commerce, are affected by the ICT infrastructure and policies, network strength and whether users prefer technology-mediated meetings as well as other factors which were included in this study.

Extension of the Literature by Understanding the Demographic Factors in the Model in the Three Arab Countries

This research extends knowledge on the effects of the demographic factors in the model, including, age, gender, experience, education and income. This is a significant contribution, since the lack of the inclusion of moderating variables was a limitation in previous studies that tested UTAUT, as reported in the literature analysis conducted by Williams et al. (2015). The inclusion of the additional demographic factors (including income and education) was important in Jordan as both factors were found significant. Neither education nor income was significant in UAE, whilst education was a significant moderator in Iraq. Although the effects of the moderators were not consistent with what was originally anticipated, including them provided an important contribution, as differences between the groups were found even when the demographic factor did not moderate the relationship. The research provides evidence that future studies conducted in Arab countries concerning technology adoption should include demographic factors in order to understand the boundaries within which the relationship between two factors becomes significant. The inclusion of the demographic factors certainly increases the understanding of the context in which the model is more applicable.

8.2.2 Methodological Contributions

This study addresses the limitations found in previous studies that only included students to study technology adoption, as well as the studies that tested UTAUT by using students as participants, as found in Williams et al.'s (2015) study, by selecting actual consumers from different demographic areas in the main cities in the three Arab countries. Furthermore, this research provides information on the adoption and use of mobile phones (smartphones) by the young segment of the population. The research only included a certain age group, young Arab users (18-29 years old). This segment of the population has significant potential now and in the future, since it forms the highest segment of the Arab population, and young people are likely to use mobile phones and applications earlier and more extensively than older people. This makes this segment important for the mobile market.

This research provides a valuable methodological contribution in terms of the sampling method used and the way the questionnaires were distributed. In contrast to the sampling method used in the majority of previous studies related to technology adoption in Arab countries (e.g., Al-Qeisi, 2009; Khraim et al., 2011; Tarhini et al., 2015; Baabdulla et al., 2015) where convenience sampling was used, this research included a more representative sampling method which was multistage cluster sampling via face-to-face distribution. This allowed the inclusion of different consumers from different backgrounds, geographical areas and demographics in a voluntary setting, which contributed towards the validity and representativeness of the results obtained in this research. Furthermore, this contributed towards a significant decrease in sampling bias in comparison to convenience sampling, which is a non-probability sampling method.

This research contributes to knowledge in terms of the methodology by analysing the data collected from each Arab country individually rather than mixing the data and combining it into one dataset and one sample. These countries are different in terms of cultural, political, economic and technological development factors (as shown in Appendix E) and these differences should be taken into consideration when conducting research. In addition, a methodological contribution is provided by using PLS-SEM to handle a complex model with a formative scale in some of its constructs. This allowed a more accurate comparison with the results obtained by Venkatesh et al. (2012) in terms of the explanatory power of the model in each of the three countries, and consistency as this statistical technique was used for the analysis of the data in UTAUT2 (Venkatesh et al., 2012). The use of this methodology, utilising sophisticated statistical tools, was limited in the previous literature on technology acceptance in Arab countries. The use of the non-parametric PLS-MGA test via SmartPLS Version 3.0 software is also still new to the field of technology adoption in Arab countries. It is important because it allows the testing of differences between groups when models are complex and have formative constructs.

8.2.3 Practical Implications

The theoretical contributions (extension of UTAUT2) are strongly linked to the practical contributions. The practical contributions are not limited to the increase in mobile phone (smartphone) penetration, but also enhance the efficient use and better exploitation of what is available through mobile phones, including mobile applications and services. Thus, it contributes towards enhancing the depth of use of the new generation of mobile phones. Moreover, one of the main practical contributions is that it contributes towards improving the understanding of young customers' preferences and behaviour when using mobile phones which, in turn, contributes to the development of more specific targeting techniques and therefore increased customer satisfaction.

This research provides several practical implications within the context of mobile phone adoption and use in Arab countries. The key stakeholders that can benefit from the practical implications of this research include:

1. Telecommunication companies, specifically mobile operators, currently operating or willing to operate in the region.
2. Government initiatives and policymakers.
3. Mobile application developers.
4. Mobile handset manufacturers.

This research provides valuable information to these key stakeholders based on the analysis of the data collected from the young population in three Arab countries, which constitutes the highest segment of the population and the most important one, too. The findings of this research can assist telecommunication companies (mobile operators) in the countries included in the study to target their younger customers and increase customer satisfaction.

The model in each country helps mobile operators, handset manufacturers and mobile application developers to understand which characteristics have the most relative importance within the context of mobile phone adoption and use in a particular country from the three countries included in the study. Telecommunication companies, handset manufacturers and mobile application developers need to understand that beyond the two traditional factors in TAM (usefulness and ease of using mobile phones), which are important, there are other, more important factors highlighted in this research that can affect mobile phone and application adoption and use for young Arab users.

The findings indicate that there are a number of factors that can affect users' intention to use mobile phones, including Perceived Relative Advantage (usefulness), Effort Expectancy, National IT Development, Habit, Preference for technology-mediated meetings and Price Value. Enjoyment is important for mobile phone adoption in Jordan and UAE. Therefore, mobile application developers are encouraged to concentrate on developing mobile applications such as mobile gaming applications and other applications that are created for enjoyment and entertainment. Due to the low level of command of English language in comparison to Arabic, mobile application developers are also encouraged to include Arabic content as well as English in order to be actively used by consumers in Jordan and Iraq.

Price value proved to be significant in all three Arab countries. Furthermore, the high prices of mobile handsets, mobile tariffs and mobile Internet were found to be some of the main issues facing mobile phone adoption and use from the consumers' perspective in all three countries. Therefore, it is important for telecommunication companies, handset manufacturers and policymakers to ensure that the prices of mobile handsets, mobile Internet and applications are actually reasonable in comparison to the benefits they provide. New pricing policies related to tariffs are also required in all three countries. There is a need to introduce further competition in the mobile market and careful spectrum band allocation in all three countries. In the case of Jordan, tax reduction (in both general and specific taxes) is required. Removing restrictions on mobile phone applications in UAE is required from the consumers' perspective. Policymakers need to ensure a transparent regulatory environment which is open and easy for consumers to understand and evaluate. These changes, in turn, will also contribute towards the enhancement of national IT development, which was found to be a significant factor affecting both Behavioural Intention and Actual Use of mobile phones.

The findings indicated that young Arabs do not object to technology-mediated meetings. Therefore, allowing the use of mobile messaging applications such as Skype, Viber, FaceTime and WhatsApp which enable technology-mediated meetings is important in UAE. Furthermore, mobile and telecommunication companies and marketing companies can concentrate on supporting different mobile phone applications for technology-mediated meetings in the three countries included in the study. Enhancing and supporting the use of m-commerce and mobile banking is important, since these services are less used in comparison to other mobile applications in Jordan and UAE, while they are not currently in use in Iraq. This calls for policymakers, companies, businesses, governments' initiatives and mobile application developers to collaborate to find new ways to successfully promote and encourage the adoption and use of these mobile services.

Telecommunication companies can use the findings of this research with regard to the demographic variables including age, gender, education, income and experience in order to better target their young customers. Furthermore, addressing gender differences, especially as gender was a strong moderator in all three countries, is required in order to correctly target more females, which will contribute towards reducing gender gaps, especially in Iraq. Gender differences occurred in the model in all three countries. Mobile phones can play a significant role in helping Arab women to become economically independent and overcome cultural barriers (Ameen and Willis, 2016b). For example, the results of this research revealed that Iraqi women are interested in technology-mediated meetings. Hence, this can be explored further by mobile companies and policymakers to find better ways to benefit these women in, for example, running their businesses via m-commerce or enhancing their learning via m-learning.

Iraq needs to be more open to more technologically advanced countries and the training provided by foreign companies. Since technological culturation was found to be highly significant for users in Iraq, collaborating with foreign and international companies or handset manufacturers to provide training and events to apprise users in Iraq of all the options they have when using mobile phones is important. These options include the different mobile services that are currently unavailable in Iraq, for example m-commerce and m-banking. Users in Iraq also need to be apprised of the benefits these services can bring to them as consumers. Furthermore, ensuring a good network connection is vital to enhancing the use of these applications and the full exploitation of the services available through the use of mobile phones.

8.3 Research Limitations

Whilst this research has provided valuable and relevant findings, a number of limitations which are relevant to future research are presented below.

The data from Iraq were collected from the northern part (Erbil). The researcher could not collect any primary data from the southern part, the capital city (Baghdad), due to the politically unstable situation which made it unsafe for the researcher to travel and collect data from households there.

To the best of the researcher’s knowledge, there is no accurate up-to-date data on the population of young Arabs in each selected city and district in this research, which prevented the research having an accurate sampling frame. In addition, the sample size selected in this research was equal among all three countries, despite the differences between them in terms of their population size. The reason behind this was to ensure that the differences in the sample size did not affect the multigroup analysis test for the sample or introduce any bias in terms of the significance of the relationships in the model in each country. The selected sample size was appropriate for the PLS-SEM analysis and multigroup analysis and was consistent with what most of the previous studies have employed. However, this sample still limits the possibility of generalising the results and findings of this research.

The context of this research was consumers in urban areas (main cities in three countries). Therefore, the findings of this research cannot be generalised to include consumers in rural areas, as there are major differences between consumers in urban and rural areas in many aspects, for instance in terms of access to technology, experience in using technology, ICT infrastructure, education level and economic and social levels. However, this research opens a new path for future studies to be conducted in rural areas in these countries.

Although every effort was made to ensure a comprehensive analysis of the collected data from all three countries, just like any other statistical technique for analysing data, PLS-SEM has its own limitations (see Appendix O). These limitations can be used to guide future studies concerned with the domain of technology adoption and use in Arab countries. This is discussed further in the next section.

8.4 Directions for Future Research

It is the researcher's intention to use the results of this research to conduct further studies on mobile phone adoption in each of the three countries separately, from the perspective of telecommunication companies and policymakers. The researcher will present the findings of this research and conduct interviews with senior managers in telecommunication companies and policymakers in each of the three countries in order to address the issues that were found important from the perspective of the participants in this research in terms of prices and policies related to mobile phones.

There is certainly a need for more research in relation to technology adoption to be conducted in Iraq. Not only is there a lack of studies on technology acceptance and use in Iraq, there is a lack of data on the operations of mobile companies operating in the country and the mobile market in general. The country forms the third largest mobile market in the Arab world (GSMA, 2014) and the findings of this research indicate that young individuals there are active users of mobile phones despite the unstable political situation. The findings of this research can be used to conduct future studies in Iraq. For example, the results for the model in Iraq showed that being open to other, more technologically advanced countries/markets and training provided from foreign companies was found important for young Iraqis. Therefore, future studies will be conducted to investigate the possibility of implementing this in practice by offering practical solutions based on data gathered from policymakers and telecommunication companies in Iraq.

Future studies can test the model proposed in Figure 4.1 in Arab countries and explore whether SI and FC are significant in any other Arab countries. The investigation of the effects of SI and FC could be carried out with a sample of inexperienced or low experienced users in a voluntary setting using new technologies, as the results could otherwise be different to what was found in this research in terms of their significance. The model developed in this research should be tested in other Arab countries using actual consumers of mobile phones rather than students or employees in order for other researchers to be able to accurately compare their results with the results obtained in this research.

It would also be interesting to include more cross-cultural research within the other Arab countries to provide further insights into the similarities and differences between them. The model could also be tested using other technologies in order to find out whether it applies to other types of technology. Future studies that conduct cross-cultural research are encouraged to test their models by analysing the data collected from each country separately in order to obtain accurate results. This is important in order to understand the differences within Arab countries as well as understanding the differences between them and the developed countries in terms of technology adoption and use.

UTAUT2 is certainly a new model which has not been tested in many countries from the consumers' perspective. Future studies, whether conducted in developed or developing countries, can test or extend the model to be applicable to the specific demographic area where the research is conducted and the specific type of technology under investigation. This study was mainly concerned with young users in major cities (urban areas). It would be interesting for future studies to test the model and investigate mobile phone adoption in rural areas where the level of ICT infrastructure, access to technology and technological development is lower and cultural beliefs are possibly stronger.

Further investigation of the impact of the moderators age, gender, experience, income and education is required. Experience should be included in models to be developed in future studies and frequency of use could be considered as well as length of time using the system. The findings of this research regarding the non-moderating effects of some of the demographic variables in some countries and the contradicting results with what was originally hypothesised call for further investigation in this area. Future studies could include older users in areas where gender, education and income differences are more apparent in order to find out whether the effects of the moderators become more apparent. Furthermore, future studies could also use a mixed selection of young users, especially because they form a large and important segment of the population, from different income and education levels with high and low experience levels in different geographical areas.

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Appendix-A: Examples of Studies Testing UTAUT and UTAUT2 in Arab Countries

Author	**Country**	**System/ Context**	**Participants and Methods**	**Findings**
Abu-Shanab and Pearson (2007)	Jordan	Internet Banking	A questionnaire was developed and distributed in three banks. The participants were banks customers. 878 questionnaires were used in the analysis. Data were analysed using factor analysis (multiple regression).	PE, EE and SI had significant effects on BI while FC did not have any effect on BI. FC was not tested in the model. Gender, age and experience were moderators in the model.
Al-Gahtani et al. (2007)	Saudi Arabia	Desktop Computer Applications	The participants were knowledge workers in four organisations. A total of 722 questionnaires were used. Data were analysed using PLS-SEM.	PE had a significant effect on BI and this effect was moderated by age. SN had a significant effect on BI and this effect was moderated by age and experience. EE did not have any significant effect on BI. FC had a weak effect which changed with the moderating effect of age (resulted in negative interaction) and experience (resulted in strong positive interaction).
Abu-Shanab and Pearson (2009)	Jordan	Online Banking	940 questionnaires were collected from a bank's employees. Data were analysed using Preliminary Regression Analysis and Confirmatory Factor Analysis.	PE, EE, SE, BI, Anxiety, Perceived Trust and Perceived Innovation were unique factors and highly reliable. Some items were deleted from the constructs: SI, Perceived Facilitating Conditions, Perceived Risk and Locus of Control.
Al-Shafi and Weerakkody (2009)	Qatar	E-Government	Interviews with citizens and researchers were conducted as a preliminary stage to formulate and validate the survey questions. The questionnaire was the primary data collection method in this study. Data from 216 questionnaires completed by citizens. were used in the analysis. Linear Regression Analysis was used to analyse the data.	PE, EE and SI had significant impacts on BI to use e-government services in Qatar. Gender, age and Internet Experience were found to have an insignificant effect on BI.
Al-Shafi and Weerakkody (2010)	Qatar	E-Government	1179 questionnaires were collected from citizens including senior managers, directors and professionals. Data were collected using Principal Component Analysis.	PE and SI had significant effects on BI. EE was insignificant. BI had a significant effect on e-government use. Gender, age and education were found to be significant moderators.
Abu-Shanab et al. (2010)	Jordan	Internet Banking	Jordanian bank customers in three major cities in Jordan were the participants of this research. A total of 523 questionnaires were collected as a final sample.	PE, EE and SI were found to be significant predictors of BI. Gender was significant while age was not significant as a moderator. FC was not

			Factor Analysis was used to analyse the collected data.	significant. SE, Perceived Trust and Locus of Control were significant while Anxiety, Personal Innovativeness and Personal Risk were insignificant.
Alkhunaizan, and Love (2012)	Saudi Arabia	Mobile Commerce	574 surveys were collected from smartphone users in Saudi Arabia. Data were analysed using Principal Component Analysis.	Trust, Costs and PE were significant predictors of BI. Usage Intention had a significant effect on actual use. FC had no significant effect on Use.
Nassuora, (2012)	Saudi Arabia	Mobile Learning	80 questionnaires were distributed to students at Al-Faisal University. Data were analysed using Squared Multiple Correlations.	Social Factors and FC had significant effects on Attitude while PE and EE had no significant effects on it. PE, Attitude and EE had a significant effect on BI while Social Factors and FC had no significant effects on BI.
Salim, (2012)	Egypt	Online Social Media	A survey was distributed online to the followers of Khalid Saied's Facebook page. Data from 87 questionnaires were used in the analysis. Data were analysed using Spearman Correlation Analysis and descriptive statistics in SPSS.	PE, EE and SI had significant effects on BI. FC had a significant effect on BI when the relationship was moderated by experience and age. Age, experience and gender had moderating effects on some of the relationships.
Al Mashaqba and Nassar (2012)	Jordan	Mobile Banking	162 questionnaires were distributed to customers of banks in Jordan. PLS modelling was used to test the data.	Security had a significant effect on BI. FC had a significant effect on Use. PE was moderated by education and experience while SI was not. FC was moderated by education and experience.
Al Otaibi, (2013)	Saudi Arabia	Mobile Exchange	A questionnaire was sent to 442 mobile traders in Saudi Arabia. Data were analysed using SEM.	PE, EE, SI and M-Tadawul Characteristics had significant effects on BI. Gender, age and education had significant moderating effects in the model.
Al Imarah et al. (2013)	Iraq	E-services	430 questionnaires were distributed to students at the University of Kufa. SEM was used to analyse the data.	PE and EE had significant effects on BI while FC did not have a significant effect on BI. Both FC and BI were significant determinants of use behaviour.
Alshehri et al. (2013)	Saudi Arabia	E-Government	400 questionnaires were distributed to Saudi citizens. Data were analysed using SEM.	PE, EE and FC were found to be significant predictors of BI. SI was not found significant. Internet Experience was a significant moderator in the model. The moderators age and gender were found significant in the model.
Al-Qeisi et al. (2014)	Jordan	Online Banking	216 questionnaires were completed by users of banking services and data were analysed using Confirmatory Factor Analysis-SEM.	Website Quality had a significant effect on Internet Banking Usage directly and through PE. SI did not have a significant effect on PE. Exp had a positive effect on EE, PE and Website Quality Perception.

Albugami and Bellaaj (2014)	Saudi Arabia	Internet Banking	133 questionnaires were completed by lecturers, students and university staff members. Data were analysed using PLS-SEM.	The study used UTAUT2 as the basis for its theoretical framework. PE, HT, Website Design and Security were significant factors in the model. EE, SI and FC were insignificant.
Alalwan et al. (2014)	Jordan	Internet Banking	348 questionnaires were collected from Jordanian banking customers. SEM was used to analyse the collected data.	The study used UTAUT2 as the basis for its model. PE, Hedonic Motivation, FC, Trust and Perceived Risk had significant effects on BI. FC and Trust had significant effects on PE. FC had a direct significant effect on use. Trust had a significant effect on Hedonic Motivation. BI had a significant effect on Use of Internet banking.
Faeeq et al. (2015)	Iraq	E-Government	Staff of public universities including lecturers and administrations completed 75 questionnaires. Data were analysed using PLS-SEM.	The results showed that EE and PE were significant determinants of use of e-government. SI did not have any significant effect on Use. BI was eliminated from the model.
Jawad and Hassan (2015)	Iraq	Mobile Learning in Higher Education	159 questionnaires completed by students and lecturers were included in the analysis. Data were analysed using Regression Analysis.	PE, Self-Management Learning, EE, Perceived Playfulness and SI were significant predictors of BI. Also, BI and FC were significant determinants of Use of mobile learning in higher education.
Baabdullah et al. (2015)	Saudi Arabia	Mobile Government	Data from 418 questionnaires which were distributed in three cities in Saudi Arabia were analysed using Descriptive Analysis. Convenience sampling was used to select mobile government users as participants in their research.	The model developed in this study was based on UTAUT2. PE, EE, SI, FC, HM, PV, Innovativeness and BI were found to be significant in the model.
Al-sahouly (2015)	Egypt	E-Commerce	600 Egyptian respondents participated in the study. Data were analysed using Regression Analysis.	The model developed in this research was based on UTAUT2. EE, HM, FC, SI, Online Trust, Online Satisfaction and Online Interactivity had significant effects on BI towards the adoption of e-commerce among Egyptian customers. Age, gender and experience did not have any moderating effects in the model.
Masa'deh et al. (2016)	Lebanon	E-Learning Systems	359 questionnaires were completed by students at two universities in Beirut. SEM was used to analyse the collected data.	UTAUT2 was tested in this study. PE, HM, HT and Trust had significant effects on students' BI. BI and FC were significant predictors of Usage Behaviour.
Badwelan et al. (2016)	Saudi Arabia	Mobile Learning	Questionnaires were collected from 401 undergraduate distance learning students using snowball sampling. Data were analysed using SEM-Exploratory Factor	PE, EE, Lecturers' Influence (Social Influence), Personal Innovativeness and Self-Management of Learning had significant effects on BI to use

			Analysis and Confirmatory Factor Analysis.	mobile learning. EE had the weakest effect on BI in the model.

Source: Author’s own

Appendix-B: Summary of the Main TA Theories Included in this Research

Theory	Key authors	Key concept and constructs	Methodology used	General implications	Specific implications for this research
Technology Acceptance Model (TAM)	Davis (1989)	Explore the fundamental determinants of user acceptance of computers. The determinants included **perceived usefulness**, **perceived ease of use**, **behavioural intention** and **Attitude.**	The author tested the users' acceptance of using a computerised mail system and file editor as well as IBM PC-Based graphics systems to test the variables. Two different methods of testing took place. 1st study: 112 staff members of an organisation with 6 months' experience with the system. 2nd study: 40 students using the two systems for the first time.	Usefulness is the main driver of technology usage followed by ease of use. Both constructs affect the individual's intention towards a certain behaviour.	Although this model was mostly tested on employees and students and most of the selected participants were familiar with computer systems, it is highly applicable to the individual user's case. Perceived usefulness, perceived ease of use and behavioural intention can be important determinants for mobile phone adoption by Arabs.
Theory of Reasoned Action (TRA)	Fishbein and Ajzen (1975) and Ajzen and Fishbein (1980)	Two main constructs including **attitude** and **subjective norm** affect **behavioural intention**, which, in turn, affects **behaviour**.	The work was a result of a research programme that was initiated in the 1950s based on the prediction of behaviour in applied settings.	Subjective norm and attitude were found to be important and fundamental as an initial stage of explaining how humans perform a certain behaviour.	The theory emphasises the importance of attitude (i.e., individual's beliefs on conducting a certain behaviour) and the importance of other groups or referents around the individual and their motivation to comply with their expectations, referred to as subjective norm. The two constructs were found to be important in subsequent studies on IS adoption.

Theory of Planned Behaviour (TPB)	Ajzen (1985, 1991)	Three main constructs that were found to affect user's **intention** towards behaviour including; **attitude towards behaviour**, **subjective norm** and **perceived behaviour control**	Direct observation of cross-case studies and self-reports.	The main three constructs were found to be central to understand human behaviour and enable researchers to predict future behaviour. Past behaviour can be used to predict future behaviour. The external environment that surrounds the individual user plays a critical role in the decision-making process in relation to technology adoption.	According to the theory, perceived control over behaviour greatly increases when there are less obstacles and more 'resources' available (Ajzen, 1991). This can be applicable to mobile adoption. The model emphasises the importance of external factors such as 'subjective norms' where social factors play an important part. Within the context of mobile adoption, the decision to develop a new behaviour is dependent on the original 'intention' to use it. However, other external factors can control a user's behaviour and have a greater influence on behaviour. A combination of internal motivation and external factors is required to understand the individual Arab user's mobile adoption. Subjective norm and perceived behaviour control are influenced by communication and messages towards the individual's attitudes towards certain behaviour. This is also relative to this study.
Combined TAM and TPB model (Augmented TAM)	Taylor and Todd (1995c)	The **attitude** was disintegrated to include **perceived usefulness** and **perceived ease of use.** The authors also added **subjective norm** and **perceived behavioural control** to TAM.	A sample of 430 experienced users and 356 inexperienced 'potential' users of technology systems was used.	The model is applicable to both experienced and inexperienced users. Behaviours towards IT usage are stronger amongst experienced users. There are major differences in behaviour between experienced and inexperienced users. Behavioural intention is higher amongst experienced users. The authors suggested that in order to encourage inexperienced users to use technology systems, companies need to provide information about advantages of using them as well as the main 'control factors'. These constructs change during the system's life cycle.	The main constructs of Augmented TAM can be used in this research. Providing information to users without prior experience has a significant effect on intentions. Perceived usefulness is the most significant construct for inexperienced users. Perceived behaviour control has a direct impact on behaviour. Filling the 'expectation gap' for inexperienced users is important by providing 'realistic expectations' (comparing costs and benefits). The results suggested that new users tend to ignore how hard or easy the task is if they believe it is useful.

Model of PC Utilisation (MPCU)	Thompson et al. (1991) based on Triandis' (1977; 1979) Theory of Human Behaviour	The authors tested a subset of the Theory of Human Behaviour developed by Triandis (1977; 1979). The model included the constructs **job fit, complexity, long-term consequences, affect towards use, social factors and facilitating conditions.** These factors were tested in the study.	The study was carried out in a manufacturing organisation. Data were collected from knowledge workers using questionnaires. a final sample of 212 questionnaires was used.	The findings of the research indicated that social factors, complexity, job fit and long-term consequences are important for PC utilisation (Thompson et al., 1991). However, affect and facilitating conditions was not found significant. The study did not include habit. However, the authors indicated its importance in PC utilisation in an organisational setting.	The model was originally developed for PC utilisation amongst employees in organisations. Again, social factors and facilitating conditions may play a critical role in mobile phone adoption. They were included in UTAUT and they were significant.
Motivational Model	Davis et al. (1992)	Explore the significant motivations of intention towards usage. The authors found two significant constructs: **Extrinsic motivation and Intrinsic motivation**.	Two studies were carried out. The first used 200 MBA students (field study of Word Processor usage). The second study used 40 MBA students based on a laboratory study using business graphics software.	Actual usefulness and enjoyment are two main motivators of users' intention towards system usage.	Perceived enjoyment can be a motivator towards intentions towards use as well as perceived usefulness. However, perceived usefulness may have a stronger influence and it is important to consider even when the task is enjoyable.
Social Cognitive Theory (SCT)	Compeau and Higgins (1995a) built based on the original Social Cognitive Theory developed by Bandura (1986)	The theory was used to understand the factors that surround the individual user, personal factors and behaviours related to technology usage. The core constructs of the theory are **outcome expectations-performance, outcome expectations-personal, computer self-efficacy, affect, encouragement by others, others' use, support and anxiety**.	2000 surveys were mailed. The respondents were randomly selected knowledge workers including managers and professionals. 1020 questionnaires were included in the analysis.	In general, the theory helps in understanding the importance of individuals' confidence when they begin to use technology. The theory emphasises the importance of including both personal and environmental factors when studying technology acceptance and use.	The theory shows that perceived benefits can include outcomes related to personal accomplishments as well as job performance. This research makes use of and includes Social Cognitive Theory in the same way Venkatesh et al. (2003) used it in UTAUT. The authors found that Computer Self-Efficacy diminishes over time as individuals continue to use technology and this is captured by Effort Expectancy. Since this research is concerned with young users who are generally familiar with the use of mobiles and includes effort expectancy as a factor in the model, it is highly possible that the effect of self-efficacy has diminished here. The construct outcome expectations is similar to perceived usefulness in TAM, relative advantage in DoI and Effort Expectancy in UTAUT.

Unified Theory of Acceptance and Use of Technology (UTAUT)	Venkatesh et al. (2003)	The model was built from an organisational point of view using organisational settings by gathering and testing eight main models related to technology usage: 'Theory of Reasoned Action, the Technology Acceptance Model (TAM), the Motivational Model, the Theory of Planned Behaviour (TPB), Combined TAM and TPB, the Model of PC Utilisation, the Innovation Diffusion Theory and the Social Cognitive Theory'. The constructs of UTAUT emerged by gathering the applicable constructs of these models. The main constructs are **Performance expectancy, effort expectancy, social influences, facilitating conditions and behavioural intention.** The authors added the important moderators that affect these constructs: **age, gender, experience and voluntariness.**	The research included both experienced and inexperienced users. The research was longitudinal, used to test the variables of the model in four organisations at three different points of time. The study tested the participants' IT usage at different stages, starting from the initial stage. Data were analysed using PLS-SEM.	Resources and facilities need to be provided in order to ensure continuous usage of IT especially for older people with prior experience with technology systems. When attempting to understand technology usage, factors like age, gender, experience and voluntariness must be considered. However, the authors contended that gender differences diminish at a certain age and these differences apply more to younger ages. The effect of performance expectancy on intention tends to be higher amongst younger men. Effort expectancy tends to have a stronger effect on intention amongst older users. The effect of social influence on intention is moderated by all four moderators, while the effect of facilitating conditions on usage is stronger amongst older, more experienced users.	The factors (age, gender, experience) must be considered in order to have a full understanding of the studied phenomenon. Furthermore, the constructs facilitating conditions, social influences, performance expectancy and effort expectancy can be applied to understand the factors affecting technology adoption in the Arab countries but based on the consumers' case instead of employees. Although UTAUT is targeted towards employees' adoption of technology in an organisational setting, the model developed in the theory is still related to this research as it forms the basis of UTAUT2.
Unified Theory of Acceptance and Use of Technology (UTAUT2)	Venkatesh et al. (2012)	The original UTAUT which was created to explain IT usage of employees in an organisational setting was extended to explain the IT usage of a consumer. The original model was altered. The four original constructs **Performance expectancy, effort**	The model was tested using mobile Internet technology in Hong Kong where mobile penetration rate exceeds 100%. An online survey was carried out over two stages. First, the initial stage where users participated in the survey for the first time. The second stage took place four months later to understand how the	The effect of facilitating conditions on intention was hypothesised to be stronger amongst older women with a low level of experience. However, only age and gender were significant moderators. Hedonic motivation is higher amongst younger men in the early stages of	The model combines the major factors found in the main technology acceptance theories. Therefore, the factors included in the model may very well apply to the case of Arab users. The model was tested using one type of technology (mobile Internet). New constructs can also be added for the case of the Arab countries such as culture and national IT development The age range in this research is varied, people can range from young adults up to adults responsible for families. The age

		expectancy, social influences and **facilitating conditions** remained and three new constructs (**hedonic motivation, price value and habit**) were added as they were found applicable to the case of individual consumers. The moderators (**age, gender, experience**) were included. However, voluntariness of use was eliminated.	participants were using their mobile Internet in terms of testing (habit and experience). The total sample size was 1,512 participants.	experience with technology. Companies need to concentrate on hedonic and utilitarian benefits. Price value is higher amongst older women. Companies need to consider this when pricing their IT products. Habit is subjective depending on the stability of the environment and the individual's level of sensitivity towards the changing environment. Habit has a strong effect on behavioural intention with older men and high experience. Habit has a strong effect on use of technology amongst older men with high experience. Intention has a stronger effect on use when the individual has less experience in using technology.	where people were considered older in Venkatesh et al.'s (2012) research was not stated. The mean value for age in their research was 31. The model can be applied to the current research to understand the variations and effects of age, gender and experience (as the research is concerned with different segments varying from individuals with no or little experience in using mobile phones to highly experienced users). Habit does not apply during the initial stage prior to using technology products but may very well have a strong effect on BI during the later stages of usage.
Diffusion of Innovation (DoI)	Rogers (2003)	Five stages of the innovation decision process were stated: **knowledge, persuasion** (in which the five main attributes of **relative advantage, complexity, compatibility, trialability and observability** become important)**, decision, implementation and confirmation.** The level of communication and interaction with the social system is the key determinant of the adopter categories, **innovators, early adopters, early majority, late majority and laggards** an individual can belong to.	The concepts of the theory were based on an investigation of a series of empirical studies and projects in different areas.	Users can be at different stages of interaction with the social system and this must be taken into consideration when studying technology adoption and usage. The same also applies for the stages of decision-making to adopt different technologies.	The order of the stages of the decision-making process could be different for the case of the Arab users. In terms of adopter categories, Arab users have adopted mobile phones later than users in other countries.

Appendix-C: Mobile Cellular Subscriptions (Per 100 People) in Arab Countries

Country name	2009	2010	2011	2012	2013	2014
Algeria	94	88	94	98	101	93
Bahrain	120	125	131	161	166	173
Egypt, Arab Rep.	69	91	105	120	122	114
Iraq	65	75	80	82	96	95
Israel	124	123	122	121	123	121
Jordan	100	103	111	128	142	148
Kuwait	99	133	158	157	190	218
Lebanon	57	66	77	81	81	88
Libya	152	180	164	156	165	161
Morocco	80	101	114	120	129	132
Oman	146	164	159	159	155	158
Qatar	122	125	120	127	153	146
Saudi Arabia	167	189	195	187	184	180
Sudan	36	42	69	74	73	72
Syrian Arab Republic	50	54	59	59	56	71
Tunisia	95	105	115	118	116	128
United Arab Emirates	154	129	131	150	172	178
Yemen, Rep.	36	49	50	58	69	68

Source: World Bank, 2016

Appendix-D: Regulatory Landscape for Mobile Cellular and Mobile Broadband Services for Selected Arab Countries, December 2011

	Mobile-cellular services		Mobile-broadband services	
Country	Regulatory landscape	Number of service providers	Regulatory landscape	Number of service providers
Algeria	Competitive	3	Service not available	0
Bahrain	Competitive	3	Competitive	3
Comoros	Monopoly	1	Service not available	0
Djibouti	Monopoly	1	N/A[6]	N/A[6]
Egypt	Competitive	3	Competitive	3
Iraq	Competitive	4[1]	Monopoly	1[7]
Jordan	Competitive	3	Duopoly	2[8]
Kuwait	Competitive	3	Competitive	3
Lebanon	Government-owned duopoly	2	Service not available	0[9]
Libya	Government-owned duopoly	2	Monopoly	1
Mauritania	Competitive	3	Competitive	3
Morocco	Competitive	3	Competitive	3
Oman	Competitive	2[2]	Duopoly[10]	2
Qatar	Duopoly	2	Duopoly	2
Saudi Arabia	Competitive	4[3]	Competitive	3
Sudan	Competitive	3	Competitive	3
Syria	BOT duopoly	2[4]	Duopoly	2
Tunisia	Competitive	3[5]	Monopoly	1[10]
UAE	Duopoly	2	Duopoly	2
Yemen	Competitive	4	Monopoly	1

Source: Connect Arab Summit, 2012

Appendix-E: Comparison of the Countries Included in the Study

	Iraq	**Jordan**	**UAE**
Population	34.8m	7.5m	9.4m
GDP-PPP	494.5 (USD billion)	80.2 (USD billion)	604.96 (USD billion)
Number of mobile cellular subscriptions (per 100 people)	95	148	178
Smartphone adoption	17%	30%	83%
Development of new technologies	No	Yes	Yes
ICT infrastructure	3G - Iraq is behind compared to other countries included in the study as it has only been launched recently.	4G - Jordan is advanced in terms of mobile networks.	4G - UAE is advanced in terms of ICT infrastructure.
Type of user **(adapted from Brach, 2010)**	Isolated user	Integrated user	Consumer
Competition	Competition	Competition	Duopoly
Policies	Poor ICT policies and regulatory environment. Compared to the other countries included in the study, Iraq is behind in terms of the regulatory environment. Major issues in the area of mobile taxation.	High regulatory and legal framework. One of the most liberalised ICT markets compared to the other countries. However, there are gaps and major issues in the area of mobile taxation.	The country is still behind in terms of creating and implementing effective ICT policies (Alfaki and Ahmed, 2013).
Culture			
Power Distance	95-High People believe in hierarchal order (power distinguished unequally).	70-High People believe in hierarchal order (power distinguished unequally).	90-High People believe in hierarchal order (power distinguished unequally).
Individualism vs. Collectivism	30-Collectivistic society	30-Collectivistic society	25-Collectivistic society

Uncertainty Avoidance	85-High People tend to avoid uncertainty. People follow certain rules and codes. Hofstede described them as moving more towards innovation resistance.	65-High People tend to avoid uncertainty. People follow certain rules and codes. Hofstede described them as moving more towards innovation resistance.	80-High People tend to avoid uncertainty. People follow certain rules and codes. Hofstede described them as moving more towards innovation resistance.
Masculinity vs. Femininity	70-Masculine society People live in order to work (Geert-Hofstede.com, 2014)	45-Feminine society People work to live (Geert-Hofstede.com, 2014). Men and women have the same values (no differences in gender roles)	50-Neither feminine nor masculine
Long-term Orientation (Pragmatic vs. Normative)	25-Normative culture People respect traditions	16-Normative culture People respect traditions	-
Indulgence	17-Restraint People do not allocate much of their time for enjoyment and they control their actions. Social norms affect these people's actions.	43-Restraint People do not allocate much of their time for enjoyment and they control their actions. Social norms affect these people's actions.	-

Source: Author's own based on the literature

Appendix-F: Comparison of Technology Acceptance Theories and Models

Model	Author	Independent							Dependent			Moderators			
		PE	EE	SI	FC	HT	HM	PV	BI	USE	ATU	AGE	GENDER	EXP	VOL
TAM	Davis (1989)	Y	Y	N	N	N	N	N	Y	Y	Y	N	N	N	N
TRA	Fishbein and Ajzen (1975) Ajzen and	N	N	Y	N	N	N	N	Y	Y	Y	N	N	N	N
TPB	Ajzen (1991)	N	N	Y	Y	N	N	N	Y	Y	Y	N	N	N	N
SCT	Bandura (1986); Compeau and	Y	PF	Y	PF	N	Y	N	N	Y	N	N	N	Y	N
DTPB	Taylor and Todd (1995b)	Y	Y	Y	Y	N	N	N	Y	Y	Y	N	N	N	N
A-TAM	Taylor and Todd (1995c)	Y	Y	Y	Y	N	N	N	Y	Y	Y	N	N	Y	N
TAM2	Venkatesh and Davis (2000)	Y	Y	Y	N	N	N	N	Y	Y	N	N	N	Y	Y
UTAUT	Venkatesh et al. (2003)	Y	Y	Y	Y	N	N	N	Y	Y	N	Y	Y	Y	Y
UTAUT2	Venkatesh et al. (2012)	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	N

		Independent							Dependent			Moderators			
Model	**Author**	**PE**	**EE**	**SI**	**FC**	**HT**	**HM**	**PV**	**BI**	**USE**	**ATU**	**AGE**	**GENDER**	**EXP**	**VOL**
MOPTA-M	**Van Biljon and Kotze (2008)**	**Y**	**Y**	***Y**	**Y**	**N**	**N**	**N**	**Y**	**Y**	**N**	**Y**	**Y**	**N**	**N**
DoI	**Rogers (2003)**	**Y**	**Y**	**Y**	**Y**	**PF**	**N**	**N**	**N**	**N**	**N**	**PF**	**N**	**PF**	**N**
MPCU	**Thompson et al. (1991)**	**Y**	**Y**	**Y**	**Y**	**PF**	**N**	**N**	**N**	**Y**	**N**	**N**	**N**	**Y**	**N**
MM	**Davis et al. (1992)**	**Y**	**N**	**N**	**N**	**N**	**Y**	**N**	**Y**	**Y**	**N**	**N**	**N**	**PF**	**N**

Y-Yes/ present N-No/not present PF-Partly Found

*Social Influence included Cultural Influence and Human Nature

Source: Author’s own

Appendix-G: Assumptions of the Positivist and Interpretive Paradigms

Philosophical assumption	**Positivism**	**Interpretivism**
Ontological assumption (the nature of reality)	Social reality is objective and external to the researcher.	Social reality is subjective and socially constructed.
	There is only one reality.	There are multiple realities.
Epistemological assumption (what constitutes valid knowledge)	Knowledge comes from objective evidence about observable and measurable phenomena.	Knowledge comes from subjective evidence from participants.
	The researcher is distant from phenomena under study.	The researcher interacts with the phenomena under study.
Axiological assumption (the role of values)	The researcher is independent from the phenomena under study.	The researcher acknowledges that the research is subjective.
	The results are unbiased and value-free.	The findings are biased and value-laden.
Rhetorical assumption (the language of research)	The researcher uses the passive voice, accepted quantitative words and set definitions.	The researcher uses the personal voice, accepted qualitative terms and limited a priori definitions.
Methodological assumption (the process of research)	The researcher takes a deductive approach.	The researcher takes an inductive approach.
	The researcher studies cause and effect, and uses a static design where categories are identified in advance.	The researcher studies the topic within its context and uses an emerging design where categories are identified during the process.
	Generalisations lead to prediction, explanation and understanding.	Patterns and/or theories are developed for understanding.
	Results are accurate and reliable through validity and reliability.	The findings are accurate and reliable through verification.

Source: Collis and Hussey, 2014, pp.46-47

Appendix-H: Quantitative, Qualitative and Mixed Methods Approaches

Tend to or typically ...	Qualitative approaches	Quantitative approaches	Mixed methods approaches
• Use these philosophical assumptions	• Constructivist/ advocacy/ participatory knowledge claims	• Post-positivist knowledge claims	• Pragmatic knowledge claims
• Employ these strategies or inquiry	• Phenomenology, grounded theory, ethnography, case study and narrative	• Surveys and experiments	• Sequential, concurrent, and transformative
• Employ these methods	• Open-ended questions, emerging approaches, text or image data	• Closed questions, predetermined approach, numeric data	• Both open and closed questions, both emerging and predetermined approaches, and both quantitative and qualitative data and analysis
• Use these practices of research as the researcher	• Positions themselves • Collects participant meanings • Focuses on a single concept or phenomenon • Brings personal values into the study • Studies the context or setting of participants • Validates the accuracy of findings • Makes interpretations of the data • Creates an agenda for change or reform • Collaborates with the participants	• Tests or verifies theories or explanations • Identifies variables to study • Relates variables in questions or hypotheses • Uses standards of validity and reliability • Observes and measures information numerically • Uses unbiased approaches • Employs statistical procedures	• Collects both quantitative and qualitative data • Develops a rationale for mixing • Integrates the data at different stages of enquiry • Presents visual pictures of the procedures in the study • Employs the practices of both qualitative and quantitative research

Source: Adapted from Creswell, 2008, p.17

Appendix-I: Items for each construct and their sources

Items of each variable	Source of each item	
Facilitating Conditions		
FC1. I have the resources necessary to use mobile phones	Venkatesh et al. (2012)	
FC2. I have the resources necessary to use mobile applications	Author's own	
FC3. I have the knowledge necessary to use mobile phones	Venkatesh et al. (2012)	
FC4. I have the knowledge necessary to use mobile applications	Author's own	
FC5. My mobile phone is compatible with other technologies I use	Venkatesh et al. (2012)	
FC6. I can get help from others when I have difficulties in using mobile phones	Venkatesh et al. (2012)	
FC7. I can get help from others when I have difficulties in using mobile applications	Author's own	Dropped
Enjoyment		
Enj1. Using mobile phones is fun	Venkatesh et al. (2012)	
Enj2. Using mobile phones is enjoyable	Venkatesh et al. (2012)	
Enj3. Using mobile phones is very entertaining	Venkatesh et al. (2012)	
Price Value		
PV1. Mobile phones are reasonably priced	Venkatesh et al. (2012)	
PV2. Mobile applications are reasonably priced	Author's own	
PV3. My mobile phone is good value for money	Venkatesh et al. (2012)	
PV4. Mobile applications are good value for money	Author's own	
PV5. At the current price, mobile phones provide good value	Venkatesh et al. (2012)	
PV6. At the current prices, mobile applications provide good value	Author's own	
Social Influence		
SI1. People who are important to me think I should use mobile phones	Venkatesh et al. (2012)	
SI2. People who influence my behaviour think I should use mobile phones	Venkatesh et al. (2012)	

SI3. People whose opinions I value prefer that I use mobile phones	Venkatesh et al. (2012)	
SI4. I look for information from friends and family about the mobile phone I am interested in before buying it	Author's own (based on Deutsch and Gerard's (1955) study on social influence which included informational social influence)	Dropped
SI5. People's positive recommendations regarding a mobile phone are important to me	Author's own (based on Deutsch and Gerard (1955) and Venkatesh and Davis (2000))	Dropped
SI6. Using mobile phones helps me to have a higher status in the community	Author's own (adapted from Roger (2003), Venkatesh and Davis (2000) and Venkatesh et al. (2003))	Dropped
Habit		
HT1. The use of mobile phones has become a habit for me	Venkatesh et al. (2012)	
HT2. I am addicted to using mobile phones	Venkatesh et al. (2012)	
HT3. I must use mobile phones	Venkatesh et al. (2012)	
Perceived Relative Advantage (PRA) (usefulness)		
PRA1. I find that a mobile phone is useful in my daily life	Venkatesh et al. (2012)	
PRA2. Using a mobile phone helps me to achieve things more quickly	Venkatesh et al. (2012) and Moore and Benbasat (1991)	
PRA3. Using a mobile phone increases my productivity	Venkatesh et al. (2012) and Moore and Benbasat (1991)	Dropped
PRA4. Using a mobile phone helps me to stay connected to people	Author's own	
PRA5. Using a mobile phone makes it easier to carry out my daily activities	Moore and Benbasat (1991), with minor modifications	
Effort Expectancy		
EE1. Learning how to use mobile phones is easy for me	Venkatesh et al. (2012)	
EE2. Learning how to use mobile applications is easy for me	Author's own	
EE3. My interaction with mobile phones is clear and understandable	Venkatesh et al. (2012)	
EE4. I find mobile phones easy to use	Venkatesh et al. (2012)	Dropped
EE5. I find mobile applications easy to use	Author's own	
EE6. It is easy for me to become skilful at using mobile phones	Venkatesh et al. (2012)	

Behavioural Intention		
BI1. I intend to continue using mobile phones in the future	Venkatesh et al. (2012)	
BI2. I will always try to use mobile phones in my daily life	Venkatesh et al. (2012)	
BI3. I plan to continue to use mobile phones frequently	Venkatesh et al. (2012)	
BI4. I envisage using mobile phones in the future	Author's own	
Actual usage		
The usage frequency for each of the following: a. Mobile phone (for making calls) b. SMS c. Mobile Internet d. Games e. Mobile email f. Mobile Messaging Apps (e.g., Viber, Skype or WhatsApp) g. Mobile social media h. Mobile banking **i.** M-commerce	*Initially the question was adopted from Venkatesh et al. (2012) and additional items related to mobile services were the author's own	
Culture-Specific Beliefs and Values		
CSBV1. The fact that a mobile phone supports technology-mediated meetings is an important element in its ultimate success or failure	*Originally adopted from Straub et al. (2001) with some modifications to fit face-to-face vs. technology-mediated meetings and mobile adoption	
CSBV2. My focus on technology-mediated meetings is a factor in the final outcome	*Originally adopted from Straub et al. (2001), with some modifications to fit face-to-face vs. technology-mediated meetings and mobile adoption	
CSBV3. I prefer technology (mobile) mediated meetings rather than face-to-face meetings	*Author's own (based on Straub et al. (2001))	
Technological Culturation		
TC1. I find that due to the extent of travel for business it is important to use technology	Straub et al. (2001)	Dropped

TC2. I find that due to the extent of travel for pleasure it is important to use technology	Straub et al. (2001)	
TC3. I find that the extent of contact with family members residing abroad supports the use of technology	Straub et al. (2001)	Dropped
TC4. I find that reading foreign technology journals supports the use of technology	Straub et al. (2001)	
TC5. I find that training provided from foreign companies in my country is helpful for using technology	Author's own	
National IT development		
ND1. I find the IT industry in my country privatised	Loch et al. (2003)	Dropped
ND2. I find that the current demand for IT is high	Loch et al. (2003)	
ND3. I find that the current supply of IT is high	Loch et al. (2003)	
ND4. Government IT initiatives in policymaking are working well	Loch et al. (2003) (with adjustments)	
ND5. I find current mobile tariffs acceptable	Loch et al. (2003)	
ND6. I find that currently there are no restrictions to using different mobile applications	Based on Loch et al. (2003) with some modifications to test restrictions on mobile applications	

Appendix-J: Pilot Study

Pilot Questionnaire

Section 1: Personal Information

1. Country of birth	
2. How long have you lived in this country?	
3. What is your age?	
i. Less than 18 ◯	ii. 18-22 ◯
iii. 23-29 ◯	iv. More than 29 ◯
4. What is your gender?	
i. Male ◯	ii. Female ◯
5. What is your highest qualification?	
i. PhD degree ◯	ii. Master degree ◯
iii. Bachelor degree ◯	iv. Diploma ◯
v. High School ◯	vi. Other (please specify) ◯

6. Please give the appropriate information about your language fluency below:

	I can read it easily	I can write it easily	I can speak it easily
Arabic	◯	◯	◯
English	◯	◯	◯

7. What is your employment status?	
i. Employed ◯	ii. Self-employed ◯
iii. Unemployed and currently looking for work ◯	iv. Unemployed and not looking for work ◯
v. Student ◯	vi. Other (please specify) ◯

8. Please give the appropriate information about your personal annual income (salary+ other resources):

My personal annual income level is:

i. Less than $10,000 ◯	ii. $10,000 to $19,000 ◯

iii. $20,000 to $29,000 ◯	iv. $30,000 to $39,000◯
v. $40,000 to $49,000 ◯	vi. $50,000 or more ◯

9. How often have you travelled to non-Arab industrialised countries?

	More than 10 times per year	Less than 10 times per year	Have not travelled at all
a. Travel for business?	◯	◯	◯
b. Travel for pleasure?	◯	◯	◯

10. Please indicate your agreement or disagreement with the following statement about the use of mobile phones by giving the appropriate response

	Strongly Disagree	Disagree	Neutral or Not sure	Agree	Strongly Agree
I have maintained close contact with family members living abroad in non-Arab countries	◯	◯	◯	◯	◯

Section 2: Use of mobile phones

11. Do you use a mobile phone?

i. Yes ◯	ii. No ◯

12. If yes, how long have you been using mobile phone for?

i. Less than 3 years ◯	ii. Less than 5 years ◯
iv. Less than 7 years ◯	v. Less than 10 years ◯
vi. More than 10 years ◯	

13. If you use mobile phones, please choose your usage frequency for each of the following:

	Never	**Almost never**	**Once in a while**	**Some days**	**Most days**	**Every day**	**Many times per day**
a. Mobile phone (for making calls)							
b. SMS							

c. Mobile Internet							
d. Games							
e. Mobile email							
f. Mobile Messaging Apps (e.g., Viber, Skype or WhatsApp)							
g. Mobile social media							
h. Mobile banking							
i. M-commerce							

Section 3: Statements related to mobile phone usage

Please indicate your agreement or disagreement with the following statements about use of mobile phones by checking off the appropriate response;

1 = Strongly Disagree, 2 = Quite Disagree, 3 = Slightly Disagree, 4 = Neutral, 5 = Slightly Agree, 6 = Quite Agree, 7 = Strongly Agree.

Facilitating Conditions							
FC1. I have the resources necessary to use mobile phones	1	2	3	4	5	6	7
FC2. I have the resources necessary to use mobile applications	1	2	3	4	5	6	7
FC3. I have the knowledge necessary to use mobile phones	1	2	3	4	5	6	7
FC4. I have the knowledge necessary to use mobile applications	1	2	3	4	5	6	7
FC5. My mobile phone is compatible with other technologies I use	1	2	3	4	5	6	7
FC6. I can get help from others when I have difficulties in using mobile phones	1	2	3	4	5	6	7
FC7. I can get help from others when I have difficulties in using mobile applications	1	2	3	4	5	6	7
Enjoyment							
Enj1. Using mobile phones is fun	1	2	3	4	5	6	7
Enj2. Using mobile phones is enjoyable	1	2	3	4	5	6	7
Enj3. Using mobile phones is very entertaining	1	2	3	4	5	6	7

Price Value							
PV1. Mobile phones are reasonably priced	1	2	3	4	5	6	7
PV2. Mobile applications are reasonably priced	1	2	3	4	5	6	7
PV3. My mobile phone is good value for money	1	2	3	4	5	6	7
PV4. Mobile applications are good value for money	1	2	3	4	5	6	7
PV5. At the current price, mobile phones provide good value	1	2	3	4	5	6	7
PV6. At the current prices, mobile applications provide good value	1	2	3	4	5	6	7
Social Influence							
SI1. People who are important to me think I should use mobile phones	1	2	3	4	5	6	7
SI2. People who influence my behaviour think I should use mobile phones	1	2	3	4	5	6	7
SI3. People whose opinions I value prefer that I use mobile phones	1	2	3	4	5	6	7
SI4. I look for information from friends and family about the mobile phone I am interested in before buying it	1	2	3	4	5	6	7
SI5. People’s positive recommendations regarding a mobile phone are important to me	1	2	3	4	5	6	7
SI6. Using mobile phones helps me to have a higher status in the community	1	2	3	4	5	6	7
Habit							
H1. The use of mobile phones has become a habit for me	1	2	3	4	5	6	7
H2. I am addicted to using mobile phones	1	2	3	4	5	6	7
H3. I must use mobile phones	1	2	3	4	5	6	7
Perceived Relative Advantage (PRA) (usefulness)							

PRA1. I find that a mobile phone is useful in my daily life	1	2	3	4	5	6	7
PRA2. Using a mobile phone helps me to achieve things more quickly	1	2	3	4	5	6	7
PRA3. Using a mobile phone increases my productivity	1	2	3	4	5	6	7
PRA4. Using a mobile phone helps me to stay connected to people	1	2	3	4	5	6	7
PRA5. Using a mobile phone makes it easier to carry out my daily activities	1	2	3	4	5	6	7
Effort Expectancy							
EE1. Learning how to use mobile phones is easy for me	1	2	3	4	5	6	7
EE2. Learning how to use mobile applications is easy for me	1	2	3	4	5	6	7
EE3. My interaction with mobile phones is clear and understandable	1	2	3	4	5	6	7
EE4. I find mobile phones ease to use	1	2	3	4	5	6	7
EE5. I find mobile applications easy to use	1	2	3	4	5	6	7
EE6. It is easy for me to become skilful at using mobile phones	1	2	3	4	5	6	7
Culture-Specific Beliefs and Values							
CSBV1. The fact that a mobile phone supports technology-mediated meetings is an important element in its ultimate success or failure	1	2	3	4	5	6	7
CSBV2. My focus on technology-mediated meetings is a factor in the final outcome	1	2	3	4	5	6	7
CSBV3. I prefer technology (mobile) mediated meetings rather than face-to-face meetings	1	2	3	4	5	6	7
Technological Culturation							

TC1. I find that due to the extent of travel for business it is important to use technology	1	2	3	4	5	6	7
TC2. I find that due to the extent of travel for pleasure it is important to use technology	1	2	3	4	5	6	7
TC3. I find that the extent of contact with family members residing abroad supports the use of technology	1	2	3	4	5	6	7
TC4. I find that reading foreign technology journals supports the use of technology	1	2	3	4	5	6	7
TC5. I find that training provided from foreign companies in my country is helpful for using technology	1	2	3	4	5	6	7
National IT development							
ND1. I find the IT industry in my country privatised	1	2	3	4	5	6	7
ND2. I find that the current demand for IT is high	1	2	3	4	5	6	7
ND3. I find that the current supply of IT is high	1	2	3	4	5	6	7
ND4. Government IT initiatives in policymaking are working well	1	2	3	4	5	6	7
ND5. I find current mobile tariffs acceptable	1	2	3	4	5	6	7
ND6. I find that currently there are no restrictions to using different mobile applications	1	2	3	4	5	6	7
Behavioural Intention							
BI1. I intend to continue using mobile phones in the future	1	2	3	4	5	6	7
BI2. I will always try to use mobile phones in my daily life	1	2	3	4	5	6	7
BI3. I plan to continue to use mobile phones frequently	1	2	3	4	5	6	7
BI4. I envisage using mobile phones in the future	1	2	3	4	5	6	7

Thank you for taking the time to complete this questionnaire. If you have any queries, please do not hesitate to contact me by email or telephone

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Analysis of the Results of the Pilot Study

The descriptive statistics (Table 1) show that the majority of the respondents (n=40) were aged 23-29 years old, while 7 respondents were aged 18-22 years old. Questionnaires completed by respondents aged below 18 or over 29 were excluded as they were not within the required age group for this research. The questionnaire was completed by a high number of females (n=33, 70%) compared to males (n=14, 30%) as shown in Table 2 below.

Table 1: Age of Respondents

Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18-22	7	14.9	14.9	14.9
	23-29	40	85.1	85.1	100.0
	Total	47	100.0	100.0	

Table 2: Gender of Respondents

Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	14	29.8	29.8	29.8
	Female	33	70.2	70.2	100.0
	Total	47	100.0	100.0	

Out of 47 respondents, 34 held a bachelor degree (72%), 5 (11%) had completed high school, 2 (4%) were diploma holders, 4 (9%) were master degree holders and 2 (4%) were PhD degree holders (Table 3). The respondents were mostly employed (n=35, 75%); 3 (6%) of them were self-employed and 5 (11%) of them were students, 3 (6%)

of them were unemployed and looking for work while only 1 (2%) of them was unemployed and not looking for work (Table 4).

Table 3: Level of Education of Respondents

Education

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	High School	5	10.6	10.6	10.6
	Diploma	2	4.3	4.3	14.9
	Bachelor Degree	34	72.3	72.3	87.2
	Master Degree	4	8.5	8.5	95.7
	PhD Degree	2	4.3	4.3	100.0
	Total	47	100.0	100.0	

Table 4: Employment of Respondents

Employment

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Employed	35	74.5	74.5	74.5
	Self-employed	3	6.4	6.4	80.9
	Unemployed and currently looking for work	3	6.4	6.4	87.2
	Unemployed and not looking for work	1	2.1	2.1	89.4
	Student	5	10.6	10.6	100.0
	Total	47	100.0	100.0	

A high number of respondents (n=27, 57%) had an income of less than $10,000 per annum, while 14 (30%) had an annual income of $10,000 to $19,000. The annual income of 5 of them (11%) was $20,000 to $29,000, while only 1 (2%) of them had an annual income of $40,000 to $49,000 (as shown in Table 5). The cross-tabulation of income and employment (Table 6) showed that students had an annual income less than $10,000 per year. On the other hand, employed participants' yearly income ranged between less than $10,000 (n=21), $10,000 to $19,000 (n=11) and $20,000 to $29,000 (n=3).

Table 5: Income of Respondents

Income

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than $10,000	27	57.4	57.4	57.4
	$10,000 to $19,000	14	29.8	29.8	87.2
	$20,000 to $29,000	5	10.6	10.6	97.9
	$40,000 to $49,000	1	2.1	2.1	100.0
	Total	47	100.0	100.0	

Table 6: Cross-tabulation of Income and Employment of Respondents

Income * Employment Cross-tabulation

Count

		Employment					Total
		Employed	Self-employed	Unemployed and currently looking for work	Unemployed and not looking for work	Student	
Income	Less than $10,000	21	0	0	1	5	27
	$10,000 to $19,000	11	2	1	0	0	14
	$20,000 to $29,000	3	0	2	0	0	5
	$40,000 to $49,000	0	1	0	0	0	1
Total		35	3	3	1	5	47

All respondents used mobile phones and their experience ranged between less than 7 years to more than 10 years. In fact, the respondents had mostly used mobile phones less than 10 years (n=15, 32%) and more than 10 years (n=26, 55%), only 6 had (13%) used mobile phones for less than 7 years as shown in Table 7 below.

Table 7: Level of Experience of Respondents

Experience

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than 7 years	6	12.8	12.8	12.8
	Less than 10 years	15	31.9	31.9	44.7
	More than 10 years	26	55.3	55.3	100.0
	Total	47	100.0	100.0	

The researcher wanted to ensure that it was correct to divide the target age group (18-29 years old) into two categories (18-22 and 23-29 years old) under the assumption that respondents aged 18-22 years old were students and respondents aged 23-29 years old were employed (or more independent). A cross-tabulation (Table 8) was created and showed that out of 7 respondents aged 18-22 years old, 5 were students, 1 was unemployed and not looking for work and 1 was self-employed. Although this does not support the assumption that respondents aged 18-22 years old were students, none of the age category (23-29 years old) were students, 37 of them were employed or self-employed and 3 of them were unemployed and looking for work, meaning that people in this age group are more independent, which supports this assumption.

Table 8: Cross-tabulation of Age and Employment of Respondents

Age * Employment Cross-tabulation

Count

		Employment					Total
		Employed	Self-employed	Unemployed and currently looking for work	Unemployed and not looking for work	Student	
Age	18-22	0	1	0	1	5	7
	23-29	35	2	3	0	0	40
Total		35	3	3	1	5	47

Based on the results of the descriptive statistics, the sample is representative to an acceptable level in terms of demographics. In terms of the respondents' fluency level in Arabic and English, all respondents could read and speak Arabic. Only three of them did not write Arabic. This showed that it was possible to distribute the questionnaires in Kurdistan (Iraq) and that their responses were valid. A high number could read and write English (read, n=38 (81%), write n=32 (68%)) while 26 (55%) of them could speak English (as shown in Table 9 below).

Table 9: Fluency Level of Respondents in Arabic and English

Arabic read

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	47	100.0	100.0	100.0

Arabic write

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	44	93.6	93.6	93.6
	No	3	6.4	6.4	100.0
	Total	47	100.0	100.0	

Arabic speak

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	47	100.0	100.0	100.0

English read

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	38	80.9	80.9	80.9
	No	9	19.1	19.1	100.0
	Total	47	100.0	100.0	

English write

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	32	68.1	68.1	68.1
	No	15	31.9	31.9	100.0
	Total	47	100.0	100.0	

English speak

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	26	55.3	55.3	55.3
	No	21	44.7	44.7	100.0
	Total	47	100.0	100.0	

Table 11 below shows the descriptive statistics for mobile/mobile services usage level. The results showed that making phone calls was the most frequent use of mobile phones, followed by text messages, mobile Internet and apps. The frequency of usage of MSM, M-email and games was less than the frequency of making phone calls and texting. As M-banking and M-commerce were not used there, the low or non-usage of these two mobile services was expected for the case of Iraq. However, the author still included them in the questionnaire as they were used in both Jordan and UAE.

Table 11: Descriptive Statistics for Mobile / Mobile Services Usage

Statistics

		Calls	SMS	Mobile Internet	Games	Memail	Apps	MSM	Mbanking	M commerce
N	Valid	47	47	47	47	47	47	47	47	47
	Missing	0	0	0	0	0	0	0	0	0
Mean		6.40	5.57	5.51	4.26	4.43	5.30	4.68	1.06	1.04
Median		6.52	6.10	6.16	4.40	4.60	6.14	5.00	1.06	1.04
Mode		7	7	7	7	7	7	7	1	1

Reliability

A reliability test was first carried out using the Cronbach Alpha test to test the reliability of the items for each variable. In this study, the minimum acceptable level of the Cronbach Alpha was 0.7. The minimum acceptable value for inter-item correlations was 0.3 (Pallant, 2010). Table 12 below shows the reliability and internal consistency analysis for the items of each variable included in the study except TC, ND and USE, as they were formative factors so this test was not applicable to them. At this stage, these three constructs were assessed based on their content validity. which is a major issue for formative constructs.

Table 12: Analysis of Reliability and Internal Consistency of Variables

<table>
<tr><th>Variable</th><th>Items</th><th>Cronbach Alpha</th><th>Inter-item correlation matrix</th><th>Notes</th></tr>
<tr><td>Behavioural Intention</td><td>BI1
BI2
BI3
BI4</td><td>0.840</td><td><table>
<tr><th></th><th>BI1</th><th>BI2</th><th>BI3</th><th>BI4</th></tr>
<tr><td>BI1</td><td>1.000</td><td>.788</td><td>.509</td><td>.420</td></tr>
<tr><td>BI2</td><td>.788</td><td>1.000</td><td>.747</td><td>.409</td></tr>
<tr><td>BI3</td><td>.509</td><td>.747</td><td>1.000</td><td>.518</td></tr>
<tr><td>BI4</td><td>.420</td><td>.409</td><td>.518</td><td>1.000</td></tr>
</table></td><td>Good
*BI4 had lower inter-item correlation compared to the rest of the items and the Cronbach Alpha if this item was deleted would have increased to 0.864. However, the author chose not to delete this item for the pilot study as the item correlation was still above 0.3 and the Cronbach Alpha was still good.</td></tr>
<tr><td>CSBV</td><td>CSBV1
CSBV2
CSBV3</td><td>0.713</td><td><table>
<tr><th></th><th>CSBV1</th><th>CSBV2</th><th>CSBV3</th></tr>
<tr><td>CSBV1</td><td>1.000</td><td>.720</td><td>.381</td></tr>
<tr><td>CSBV2</td><td>.720</td><td>1.000</td><td>.331</td></tr>
<tr><td>CSBV3</td><td>.381</td><td>.331</td><td>1.000</td></tr>
</table></td><td>Acceptable</td></tr>
<tr><td>Effort Expectancy</td><td>EE1
EE2
EE3
EE5
EE6</td><td>0.330
*0.845 After deleting EE4</td><td><table>
<tr><th></th><th>EE1</th><th>EE2</th><th>EE3</th><th>EE5</th><th>EE6</th></tr>
<tr><td>EE1</td><td>1.000</td><td>.741</td><td>.517</td><td>.570</td><td>.301</td></tr>
<tr><td>EE2</td><td>.741</td><td>1.000</td><td>.556</td><td>.581</td><td>.340</td></tr>
<tr><td>EE3</td><td>.517</td><td>.556</td><td>1.000</td><td>.602</td><td>.491</td></tr>
<tr><td>EE5</td><td>.570</td><td>.581</td><td>.602</td><td>1.000</td><td>.601</td></tr>
<tr><td>EE6</td><td>.301</td><td>.340</td><td>.491</td><td>.601</td><td>1.000</td></tr>
</table></td><td>Good
*EE4 had lower inter-item correlation (less than 0.3) compared to the rest of the items and the Cronbach Alpha if this item was deleted would have increased to 0.845. Therefore, EE4 was deleted from the scale.</td></tr>
</table>

<table>
<tr>
<td>Perceived Relative Advantage</td>
<td>PRA1
PRA2
PRA4
PRA5</td>
<td>0.818
*0.843 After deleting PRA3</td>
<td><table>
<tr><th></th><th>PRA1</th><th>PRA2</th><th>PRA4</th><th>PRA5</th></tr>
<tr><td>PRA1</td><td>1.000</td><td>.836</td><td>.682</td><td>.435</td></tr>
<tr><td>PRA2</td><td>.836</td><td>1.000</td><td>.619</td><td>.513</td></tr>
<tr><td>PRA4</td><td>.682</td><td>.619</td><td>1.000</td><td>.414</td></tr>
<tr><td>PRA5</td><td>.435</td><td>.513</td><td>.414</td><td>1.000</td></tr>
</table></td>
<td>Good
*PRA3 had lower inter-item correlation (less than 0.3) compared to the rest of the items and the Cronbach Alpha if this item was deleted would have increased to 0.843. Therefore, PRA3 was deleted from the scale.</td>
</tr>
<tr>
<td>Habit</td>
<td>HT1
HT2
HT3</td>
<td>0.849</td>
<td><table>
<tr><th></th><th>HT1</th><th>HT2</th><th>HT3</th></tr>
<tr><td>HT1</td><td>1.000</td><td>.685</td><td>.769</td></tr>
<tr><td>HT2</td><td>.685</td><td>1.000</td><td>.581</td></tr>
<tr><td>HT3</td><td>.769</td><td>.581</td><td>1.000</td></tr>
</table></td>
<td>Good</td>
</tr>
<tr>
<td>Social Influence</td>
<td>SI1
SI2
SI3</td>
<td>0.718
0.805 After deleting SI4, SI5 and SI6</td>
<td><table>
<tr><th></th><th>SI1</th><th>SI2</th><th>SI3</th></tr>
<tr><td>SI1</td><td>1.000</td><td>.783</td><td>.429</td></tr>
<tr><td>SI2</td><td>.783</td><td>1.000</td><td>.538</td></tr>
<tr><td>SI3</td><td>.429</td><td>.538</td><td>1.000</td></tr>
</table></td>
<td>Good
*SI4, SI5 and SI6 had lower inter-item correlation (less than 0.3) compared to the rest of the items and the Cronbach Alpha if these items were deleted would have increased to 0.805.</td>
</tr>
</table>

<table>
<tr><td></td><td></td><td></td><td></td><td>Therefore, items SI4, SI5 and SI6 were deleted from the scale.</td></tr>
<tr><td>Price Value</td><td>PV1
PV2
PV3
PV4
PV5
PV6</td><td>0.872</td><td>
<table>
<tr><th></th><th>PV1</th><th>PV2</th><th>PV3</th><th>PV4</th><th>PV5</th><th>PV6</th></tr>
<tr><td>PV1</td><td>1.000</td><td>.714</td><td>.570</td><td>.466</td><td>.436</td><td>.342</td></tr>
<tr><td>PV2</td><td>.714</td><td>1.000</td><td>.452</td><td>.577</td><td>.640</td><td>.562</td></tr>
<tr><td>PV3</td><td>.570</td><td>.452</td><td>1.000</td><td>.701</td><td>.449</td><td>.319</td></tr>
<tr><td>PV4</td><td>.466</td><td>.577</td><td>.701</td><td>1.000</td><td>.532</td><td>.508</td></tr>
<tr><td>PV5</td><td>.436</td><td>.640</td><td>.449</td><td>.532</td><td>1.000</td><td>.750</td></tr>
<tr><td>PV6</td><td>.342</td><td>.562</td><td>.319</td><td>.508</td><td>.750</td><td>1.000</td></tr>
</table>
</td><td>Good</td></tr>
<tr><td>Enjoyment</td><td>Enj1
Enj2
Enj3</td><td>0.913</td><td>
<table>
<tr><th></th><th>Enj1</th><th>Enj2</th><th>Enj3</th></tr>
<tr><td>Enj1</td><td>1.000</td><td>.716</td><td>.755</td></tr>
<tr><td>Enj2</td><td>.716</td><td>1.000</td><td>.872</td></tr>
<tr><td>Enj3</td><td>.755</td><td>.872</td><td>1.000</td></tr>
</table>
</td><td>Very Good</td></tr>
<tr><td>Facilitating conditions</td><td>FC1
FC2
FC3
FC4
FC5
FC6</td><td>0.860
*0.879 After deleting FC7</td><td>
<table>
<tr><th></th><th>FC1</th><th>FC2</th><th>FC3</th><th>FC4</th><th>FC5</th><th>FC6</th></tr>
<tr><td>FC1</td><td>1.000</td><td>.602</td><td>.652</td><td>.624</td><td>.736</td><td>.499</td></tr>
<tr><td>FC2</td><td>.602</td><td>1.000</td><td>.464</td><td>.569</td><td>.498</td><td>.396</td></tr>
<tr><td>FC3</td><td>.652</td><td>.464</td><td>1.000</td><td>.732</td><td>.643</td><td>.528</td></tr>
<tr><td>FC4</td><td>.624</td><td>.569</td><td>.732</td><td>1.000</td><td>.626</td><td>.349</td></tr>
<tr><td>FC5</td><td>.736</td><td>.498</td><td>.643</td><td>.626</td><td>1.000</td><td>.422</td></tr>
<tr><td>FC6</td><td>.499</td><td>.396</td><td>.528</td><td>.349</td><td>.422</td><td>1.000</td></tr>
</table>
</td><td>Good
*FC7 had lower inter-item correlation (less than 0.3) compared to the rest of the items and the Cronbach Alpha if this item was deleted would have increased to 0.879. Therefore, item FC7 was deleted from the scale.</td></tr>
</table>

The final Cronbach Alpha of each variable after deleting the insignificant items is shown in Table 13 below.

Table 13: Final Cronbach Alpha Results for each Variable

Variable	**Cronbach Alpha**
BI	0.840
CSBV	0.713
EE	0.845
PRA	0.843
HT	0.849
SI	0.805
PV	0.872
ENJ	0.913
FC	0.879

Regression Analysis

Simple regression analysis (univariate regression analysis) was used to test the effect of each of the independent variables (ND, TC, CSBV, EE, PRA, HT, SI, PV, Enj, FC) on the dependent variable (BI). It was also used to test the effect of each of FC, ND, HT and BI on USE.

National IT Development- β indicated that when ND increases by one unit, BI increases by 0.372. R^2 (0.321) showed that 32% of the variance in BI can be explained by ND. The standardised Beta coefficient value is 0.567, indicating that when ND increases by one standard deviation, BI increases by 0.567 points. P value ($p=0.000$) and $t=4.612$ which indicated that ND has a significant influence on BI. Also, $a=14.734$ so BI is 14.734 when ND is zero. These results indicated that ND has a significant influence on BI and can explain 32% of the variance in BI. The results are shown in Table 14 below.

Table 14: Simple Regression analysis ND-BI

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.567[a]	.321	.306	3.74031

a. Predictors: (Constant), ND

b. Dependent Variable: BI

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	297.559	1	297.559	21.269	.000[b]
	Residual	629.548	45	13.990		
	Total	927.106	46			

a. Dependent Variable: BI

b. Predictors: (Constant), ND

Coefficients[a]

Model	Unstandardised Coefficients		Standardised Coefficients	T	Sig.	95.0% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
(Constant)	14.734	2.002		7.361	.000	10.703	18.766
ND	.372	.081	.567	4.612	.000	.210	.535

a. Dependent Variable: BI

Technological Culturation- β indicated that when TC increases by one unit, BI increases by 0.500. The standardised Beta coefficient value is 0.413, indicating that when TC increases by one standard deviation, BI increases by 0.413 points. R^2 (0.171) showed that TC explains 17% of the variance in BI. t=3.045 and p=0.004 which show that TC has a significant influence on BI. Also, a=15.179 so BI is 15.179 when TC is zero. These results showed that TC has a significant influence on BI and can explain 17% of the variance in BI (see Table 15 below).

Table 15: Simple Regression Analysis-TC-BI

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.413[a]	.171	.152	4.13310

a. Predictors: (Constant), TC

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
	Regression	158.394	1	158.394	9.272	.004[b]
1	Residual	768.713	45	17.083		
	Total	927.106	46			

a. Dependent Variable: BI

b. Predictors: (Constant), TC

Coefficients[a]

Model	Unstandardised Coefficients		Standardised Coefficients	T	Sig.	95.0% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
(Constant)	15.179	2.836		5.352	.000	9.467	20.891
TC	.500	.164	.413	3.045	.004	.169	.831

a. Dependent Variable: BI

Perceived Relative Advantage (Usefulness)- β (0.596) indicated that when PRA increases by one unit, BI increases by 0. 596. The standardised Beta coefficient value is 0.633, indicating that when PRA increases by one standard deviation, BI increases by 0.633 points. R^2 (0.401) showed that PRA can explain 40% of the variance in BI. Also, t=5.491 and p=0.000, meaning that PRA has a significant influence on BI. Also, *a*=9.541 which showed that when PRA is zero, BI is 9.541. The results showed that PRA can significantly influence BI and can explain 40% of the variance in BI (see Table 16 below).

Table 16: Simple Regression Analysis- PRA-BI

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.633[a]	.401	.388	3.51227

a. Predictors: (Constant), PRA

b. Dependent Variable: BI

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
	Regression	371.986	1	371.986	30.154	.000[b]
1	Residual	555.121	45	12.336		
	Total	927.106	46			

a. Dependent Variable: BI

b. Predictors: (Constant), PRA

Coefficients[a]

Model	Unstandardised Coefficients		Standardised Coefficients	t	Sig.	95.0% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
(Constant)	9.541	2.614		3.650	.001	4.276	14.806
PRA	.596	.109	.633	5.491	.000	.377	.815

a. Dependent Variable: BI

Culture-Specific Beliefs and Values- β=0.347 illustrated that when CSBV is increased by one unit, BI increases by 0.347. The standardised Beta coefficient value is 0.343, indicating that when CSBV increases by one standard deviation, BI increases by 0.343 points. R^2=0.118 which showed that CSBV can explain 12% of the variance in BI. Also, t=2.449 and p=0.018 which showed that CSBV has a significant influence on BI. When CSBV is zero, BI is 19.140 (*a*=19.140). According to these results, it can be concluded that CSBV has a significant influence on BI and can explain 12% of the variance in BI (see Table 17 below).

Table 17: Simple Regression Analysis- CSBV-BI

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.343[a]	.118	.098	4.26364

a. Predictors: (Constant), CSBV

b. Dependent Variable: BI

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	109.069	1	109.069	6.000	.018[b]
	Residual	818.037	45	18.179		
	Total	927.106	46			

a. Dependent Variable: BI

b. Predictors: (Constant), CSBV

Coefficients[a]

Model	Unstandardised Coefficients		Standardised Coefficients	t	Sig.	95.0% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
(Constant)	19.140	1.931		9.913	.000	15.251	23.028
CSBV	.347	.142	.343	2.449	.018	.062	.633

a. Dependent Variable: BI

Effort Expectancy- β=0.371 which showed that when EE is increased, BI is also increased by 0.371. The standardised Beta coefficient value is 0.449, indicating that when EE increases by one standard deviation, BI increases by 0.449 points. R^2=0.201, meaning that 20% of the variance in BI can be explained by EE. Also, t=3.369 with p=0.002 showed that EE has a significant influence on BI. In addition, *a*=12.913, showing that when EE is zero, BI is 12.913. These results showed that EE has a significant influence on BI and can explain 20% of the variance in BI (see Table 18 below).

Table 18 Simple Regression Analysis- EE-BI

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.449[a]	.201	.184	4.05622

a. Predictors: (Constant), EE

b. Dependent Variable: BI

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	186.725	1	186.725	11.349	.002[b]
	Residual	740.381	45	16.453		
	Total	927.106	46			

a. Dependent Variable: BI

b. Predictors: (Constant), EE

Coefficients[a]

Model	Unstandardised Coefficients		Standardised Coefficients	t	Sig.	95.0% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
(Constant)	12.913	3.232		3.996	.000	6.404	19.423
EE	.371	.110	.449	3.369	.002	.149	.593

a. Dependent Variable: BI

Habit- β=0.286 indicated that when HT increases, BI increases by 0.286. The standardised Beta coefficient value is 0.279, indicating that when HT increases by one standard deviation, BI increases by 0.279 points. R^2=0.078, meaning that 7.8% of the variance in BI can be explained by HT. The values t=1.947 and p=0.058 are high, the p value is higher than 0.05 and the t value is low. This showed that HT has no significant influence on BI. Also, a=18.866, meaning that when HT is zero, BI is

18.866. The results showed that HT does not have a significant influence on BI (as shown in Table 19 below).

Table 19: Simple Regression Analysis-HT-BI

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.279[a]	.078	.057	4.35901

a. Predictors: (Constant), HT

b. Dependent Variable: BI

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	72.061	1	72.061	3.792	.058[b]
	Residual	855.045	45	19.001		
	Total	927.106	46			

a. Dependent Variable: BI

b. Predictors: (Constant), HT

Coefficients[a]

Model	Unstandardised Coefficients		Standardised Coefficients	T	Sig.	95.0% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
(Constant)	18.866	2.521		7.483	.000	13.788	23.944
HT	.286	.147	.279	1.947	.058	-.010	.582

a. Dependent Variable: BI

Social Influence- β=0.222 meaning that when SI increases by one unit, BI increases by 0. 222. The standardised Beta coefficient value is 0.205, indicating that when SI increases by one standard deviation, BI increases by 0.205 points. R^2=0.042 which showed that 4.2% of the variance in BI can be explained by SI. Also, t=1.402 and p=0.168 which showed that SI does not significantly affect BI. Also, *a*=19.997 showed that when SI is zero, BI is 19.997. The results above showed that SI does not significantly affect BI (see Table 20 below).

Table 20: Simple Regression Analysis- SI-BI

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.205[a]	.042	.021	4.44300

a. Predictors: (Constant), SI

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	38.795	1	38.795	1.965	.168[b]
	Residual	888.311	45	19.740		
	Total	927.106	46			

a. Dependent Variable: BI

b. Predictors: (Constant), SI

Coefficients[a]

Model	Unstandardised Coefficients		Standardised Coefficients	t	Sig.	95.0% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
(Constant)	19.997	2.662		7.512	.000	14.635	25.359
SI	.222	.158	.205	1.402	.168	-.097	.540

a. Dependent Variable: BI

Price Value- β=0.029 showed that when PV increases by one unit, BI increases by 0.029. The standardised Beta coefficient value is 0.051, indicating that when PV increases by one standard deviation, BI increases by 0.051 points. R^2=0.003 meaning that PV can explain 0.3% of the variance in BI, which is insignificant. Also, t=0.344 and p=0.733which also showed that PV does not have a significant influence on BI. When PV is zero, BI is 22.826 (*a*=22.826). The results showed that PV does not have a significant influence on BI (Table 21).

Table 21: Simple Regression Analysis-PV-BI

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.051[a]	.003	-.020	4.53304

a. Predictors: (Constant), PV

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	2.427	1	2.427	.118	.733[b]
	Residual	924.680	45	20.548		
	Total	927.106	46			

a. Dependent Variable: BI

b. Predictors: (Constant), PV

Coefficients[a]

Model	Unstandardised Coefficients		Standardised Coefficients	T	Sig.	95.0% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
(Constant)	22.826	2.394		9.534	.000	18.004	27.648
PV	.029	.085	.051	.344	.733	-.141	.200

a. Dependent Variable: BI

Enjoyment- β=0.298 showed that when Enj increases by one unit, BI increases by 0.298. The standardised Beta coefficient value is 0.319, indicating that when Enj increases by one standard deviation, BI increases by 0.319 points. R^2=0.102 meaning that Enj can explain 10% of the variance in BI. Also, t=2.258 and p=0.029 which showed that Enj has a significant influence on BI. When Enj is zero, BI is 19.021 (*a*=19.021). Based on these results, Enj has a significant influence on BI (Table 22).

Table 22: Simple Regression Analysis Enj-BI

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.319[a]	.102	.082	4.30189

a. Predictors: (Constant), Enj

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	94.327	1	94.327	5.097	.029[b]
	Residual	832.780	45	18.506		
	Total	927.106	46			

a. Dependent Variable: BI

b. Predictors: (Constant), Enj

Coefficients[a]

Model	Unstandardised Coefficients		Standardised Coefficients	t	Sig.	95.0% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
(Constant)	19.021	2.130		8.930	.000	14.731	23.312
Enj	.298	.132	.319	2.258	.029	.032	.563

a. Dependent Variable: BI

Facilitating Conditions- β=0.232 meaning that when FC increases by one unit, BI increases by 0.232. The standardised Beta coefficient value is 0.362, indicating that when FC increases by one standard deviation, BI increases by 0.362 points. R^2=0.131 meaning that FC explains 13% of the variance in BI. Also, t=2.603 and p=0.012 which shows that FC has a significant effect on BI. *a*=15.818 meaning that when FC is zero, BI is 15.818. The results showed that FC has a significant effect on BI and can explain 13% of its variance (as shown in Table 23 below).

Table 23: Simple Regression Analysis-FC-BI

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.362[a]	.131	.112	4.23159

a. Predictors: (Constant), FC

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	121.321	1	121.321	6.775	.012[b]
	Residual	805.786	45	17.906		
	Total	927.106	46			

a. Dependent Variable: BI

b. Predictors: (Constant), FC

Coefficients[a]

Model	Unstandardised Coefficients		Standardised Coefficients	t	Sig.	95.0% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
(Constant)	15.818	3.059		5.171	.000	9.657	21.979
FC	.232	.089	.362	2.603	.012	.053	.412

a. Dependent Variable: BI

Table 24 below shows the order of variables according to their significance and explanatory power of BI.

Table 24: Order of Variables According to their Significance to BI (most significant to least significant)

Variable	**Sig**	**R^2**
PRA	0.000	0.401
ND	0.000	0.321
EE	0.002	0.201
TC	0.004	0.171
FC	0.012	0.131
CSBV	0.018	0.118
Enj	0.029	0.102
HT	0.058	0.078
SI	0.168	0.042
PV	0.733	0.003

Simple regression analysis was also used to test the effect of each of the variables FC, HT, ND and BI on USE.

Facilitating Conditions $\longrightarrow$ Actual Usage

β=0.250 meaning that when FC increases by one unit, USE increases by 0.250. The standardised Beta coefficient value is 0.172, indicating that when FC increases by one standard deviation, USE increases by 0.172 points. R^2=0.030 meaning that FC explains 3% of the variance in USE which is low. Also, t=1.173 and p=0.247 which shows that FC does not have a significant effect on USE *a*=29.853 meaning that when FC is zero, BI is 29.853. These results showed that FC does not have a significant effect on USE as shown in Table 25 below.

Table 25: Simple Regression Analysis FC-USE

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.172[a]	.030	.008	10.11940

a. Predictors: (Constant), FC

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	140.830	1	140.830	1.375	.247[b]
	Residual	4608.106	45	102.402		
	Total	4748.936	46			

a. Dependent Variable: USE

b. Predictors: (Constant), FC

Coefficients[a]

Model	Unstandardised Coefficients		Standardised Coefficients	T	Sig.	95.0% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
(Constant)	29.853	7.316		4.081	.000	15.118	44.587
FC	.250	.214	.172	1.173	.247	-.180	.681

a. Dependent Variable: USE

Habit ⟶ Actual Usage

β=1.071 meaning that when HT increases by one unit, USE increases by 1.071. The standardised Beta coefficient value is 0.461, indicating that when HT increases by one standard deviation, USE increases by 0.461 points. R^2=0.212 meaning that HT explains 21% of the variance in USE. Also, t=3.484 and p=0.001 which shows that HT has a significant effect on USE. *a*=20.479 meaning that when HT is zero, BI is 20.479. The results showed that HT has a significant effect on USE and can explain 21% of its variance (as shown in Table 26 below).

Table 26: Simple regression analysis-HT-USE

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.461[a]	.212	.195	9.11666

a. Predictors: (Constant), HABIT

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	1008.830	1	1008.830	12.138	.001[b]
	Residual	3740.106	45	83.113		
	Total	4748.936	46			

a. Dependent Variable: USE

b. Predictors: (Constant), HABIT

Coefficients[a]

Model	Unstandardised Coefficients		Standardised Coefficients	t	Sig.	95.0% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
(Constant)	20.479	5.273		3.884	.000	9.860	31.099
HABIT	1.071	.307	.461	3.484	.001	.452	1.690

a. Dependent Variable: USE

National IT Development ⟶ Actual Usage

β=0.275 meaning that when ND increases by one unit, USE increases by 0.275. The standardised Beta coefficient value is 0.185, indicating that when ND increases by one standard deviation, USE increases by 0.185 points. R^2=0.034 meaning that ND explains 3.4% of the variance in USE. Also, t=1.262 and p=0.214 which shows that ND does not have a significant effect on USE. *a*=31.696 meaning that when ND is zero, BI is 31.696. The results showed that ND does not have a significant effect on USE (as shown in Table 27 below).

Table 27: Simple regression analysis-ND-USE

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.185[a]	.034	.013	10.09585

a. Predictors: (Constant), ND

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	162.257	1	162.257	1.592	.214[b]
	Residual	4586.679	45	101.926		
	Total	4748.936	46			

a. Dependent Variable: USE

b. Predictors: (Constant), ND

Coefficients[a]

Model		Unstandardised Coefficients		Standardised Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	31.696	5.403		5.866	.000	20.813	42.579
	ND	.275	.218	.185	1.262	.214	-.164	.713

a. Dependent Variable: USE

Behavioural Intention ⟶ Actual Usage

The results in Table 28 below show that BI has a significant influence on BI (t=2.068, p=0.044). However, the results also show that BI can only explain 8.7% of the variance in USE, which is a low figure.

Table 28: Simple Regression Analysis BI-USE

Effect of Behavioural Intention on Actual Usage	
R^2	0.087 (8.7%)
B	0.456
A	15.827
t value	2.068
p value	0.044

The results above showed that while ND, FC, PRA, EE, Enj, CSBV and TC had a significant influence on BI, three variables, PV, SI and HT did not have any significant influence on BI. Also, while HT had a significant influence on USE, FC and ND did not have a significant effect on it. BI had a significant effect on USE, although it could only explain 8.7% of the variance in USE. The analysis of the pilot study stopped at this stage as the sample size (n=47) and the high number of variables (ten independent variables) was not helping in running multivariate regression analysis to accurately test the effect and explanatory power of all independent variables on the dependent variables and the moderating variables effects, as the minimum sample size in multivariate regression analysis exceeds the sample size of the pilot study, which means that applying a multivariate regression analysis in this may not give accurate results. The results of the pilot study were only indicative and allowed the researcher to proceed with the primary data collection for the research.

Appendix-K: Sampling and Sample size in Iraq, Jordan and UAE

Country	**City**	**Population of city**	**District**	**Population of district**	**Subdistrict**	**Sample total** **Total sample**
Iraq (Kurdistan)	Erbil	1,749,900	Shaqlawa	124,628	Salahddin	533
					Hiran	
					Balisan	
					Basirma	
					Hareer	
			Koya	95,246	Taq Taq	
					Shoresh	
					Ashti	
					Sktan	
					Segrdkan	
			Erbil City	792,981	Ainkawa	
					Bahrka	
					Shamamk	
Jordan	Amman	2,528,500	Qasabat Amman	688,360	Al-Abdali	533
					Rasal Ain	
					City Area (Al-Madinah)	
					Zahraa	
					Yarmouk	
					Badr	
					Abdoun	
					Dabouq	
					Deir Gbar	
					Al-Rabiah	
					Tla' Al Ali	

					Um Al-Summaq	
					Um Uthaina	
			Marka	602,790	Marka	
					Al-Nasr	
					Tariq	
					Basman	
			Wadi Essier	216,530	Wadi Esseer	
					New Badr	
					Marj Al-Hamam	
					Al-Bassa	
					Prince Iraq	
					Abulicorice (Abo Alsoos)	
					Al-Rajahh	
					Gap Al hamdep	
					Researchers	
					Winter Vally	
					German	
					Layer Bear Cub	
					Um Najash	
UAE	Dubai	2,213,845	*[1]Al-Barsha	23,784	*[2]First	533
					*[2]Second	
					*[2]Third	
					*[2]South one	
					*[2]South two	
					*[2]South three	
			*[1]Jumeirah	41,001	*[2]First	
					*[2]Second	

					*[2]Third	
			*[1]Al-Twar	27,729	*[2]First	
					*[2]Second	
					*[2]Third	
Total sample size						1,599

Source: Erbil Governorate, 2009; www.geohire.com, 2015; Moi.gov.jo, 2014; Dubai Statistics Centre, 2014

*[1]: Community in Dubai

*[2]: Subcommunities in Dubai

Iraq

The table above shows the population of each selected district and its subdistricts. The three selected districts in Erbil were Shaqlawa, Erbil City and Koya. The sample was distributed evenly in all subdistricts of these districts. Some of the subdistricts also included a minority of rural areas, but the researcher did not reach them.

Using Yamane's formula stated earlier, the sample size was calculated as follows:

n=1,749,900/ 1+ 1,749,900 x $(0.05)^2$

n=1,749,900 /4,375

n=400 participants

The sample size should also account for the anticipated non-response rate by adding 25%, so an additional 25% was added (100/75 x 400=533) in order to reach a minimum of 400 completed questionnaires. As a result, a total of 533 questionnaires were distributed (almost 177 questionnaires in each district). This additional number was also used in the other two countries included in this research.

Jordan

The selected districts were Amman Qasabat district, Marka district and Wadi Essier. All subdistricts that constitute each of these districts were included and the questionnaires were randomly distributed to individuals aged 18-29 years old there.

The formula used to calculate the sample size in the case of Iraq was used for Jordan, too (Yamane's formula). The total population of Amman is

$n=2,528,500 / 1+2,528,500 \times (0.05)^2$

$n=2,528,500 /6,321$

n=400 participants

A total of 533 questionnaires were distributed evenly in these districts (almost 177 questionnaires in each district).

UAE

Dubai was selected as the city to distribute the questionnaires in. Dubai is the largest city in UAE and it is the most technologically advanced, too. Therefore, it was the selected city in UAE. Dubai is divided into communities. Each of these communities includes subcommunities. The selected communities were Al-Twar, Jumierah and Al-Barshaa. All subcommunities that constitute these communities were included and the questionnaires were distributed there to individuals aged 18-29 years old.

The same formula for calculating the sample size in the case of Iraq and Jordan was used for calculating the sample size in Dubai. The total population of Dubai in 2014 was 2,213,845.

$n=2,213,845/ 1+ 2,213,845 \times (0.05)^2$

$n=2,213,845 / 5,535$

$n=400$

A total of 533 questionnaires were distributed in all subcommunities in these three communities .

Appendix-L: Final Questionnaire (After Analysis of the Pilot Study), Participant Information Sheet and Participant Consent Form

Section 1: Personal Information

1. Country of birth	
2. How long have you lived in this country?	
3. What is your age?	
i. Less than 18	ii. 18-22
iii. 23-29	iv. More than 29
4. What is your gender?	
i.Male	ii. Female
5. What is your highest qualification?	
i. PhD degree	ii. Master degree
iii. Bachelor degree	iv. Diploma
v. High School	vi. Other (please specify)____________
6. Please give the appropriate information about your language fluency (for each option in Arabic and English) below: **I can I can I can** **read it write it speak it** **easily easily easily** Arabic English	
7. What is your employment status?	
i. Employed	ii.Self-employed
iii.Unemployed and currently looking for work	iv.Unemployed and not looking for work
v.Student	vi. Other (please specify) ____________
8. Please give the appropriate information about your personal annual income (salary+ other resources): My personal annual income level is:	
i.Less than $10,000	ii.$10,000 to $19,000

iii.$20,000 to $29,000 ◯	iv.$30,000 to $39,000 ◯
v.$40,000 to $49,000 ◯	vi.$50,000 or more ◯

Section 2: Use of mobile phones

9. Do you use a mobile phone?	
i.Yes ◯	ii. No ◯
10. If yes, how long have you been using a mobile phone for?	
i.Less than 3 years ◯	ii. Less than 5 years ◯
iii. Less than 7 years ◯	iv.Less than 10 years ◯
v.More than 10 years ◯	
11. If you have a mobile phone, what make is your mobile phone? ______________________	
12. If you use mobile phones, please choose your usage frequency for each of the following:	

	Never	Almost never	Once in a while	Some days	Most days	Every day	Many times per day
i.Mobile phone (for making calls)							
ii. SMS							
iii. Mobile Internet							
iv. Games							
v. Mobile email							
vi. Mobile Messaging Apps (e.g., Viber, Skype or WhatsApp)							
vii. Mobile social media							
viii. Mobile banking							
ix. M-commerce							

Section 3: Statements related to mobile phone usage

Please indicate your agreement or disagreement with the following statements about use of mobile phones by checking off the appropriate response;

1 = Strongly Disagree, 2 = Quite Disagree, 3 = Slightly Disagree, 4 = Neutral, 5 = Slightly Agree, 6 = Quite Agree, 7 = Strongly Agree.

Facilitating Conditions							
FC1. I have the resources necessary to use mobile phones	1	2	3	4	5	6	7
FC2. I have the resources necessary to use mobile applications	1	2	3	4	5	6	7
FC3. I have the knowledge necessary to use mobile phones	1	2	3	4	5	6	7
FC4. I have the knowledge necessary to use mobile applications	1	2	3	4	5	6	7
FC5. My mobile phone is compatible with other technologies I use	1	2	3	4	5	6	7
FC6. I can get help from others when I have difficulties in using mobile phones	1	2	3	4	5	6	7
Enjoyment							
Enj1. Using mobile phones is fun	1	2	3	4	5	6	7
Enj2. Using mobile phones is enjoyable	1	2	3	4	5	6	7
Enj3. Using mobile phones is very entertaining	1	2	3	4	5	6	7
Social Influence							
SI1. People who are important to me think I should use mobile phones	1	2	3	4	5	6	7
SI2. People who influence my behaviour think I should use mobile phones	1	2	3	4	5	6	7
SI3. People whose opinions I value prefer that I use mobile phones	1	2	3	4	5	6	7
Perceived Relative Advantage (PRA) (usefulness)							

PRA1. I find that a mobile phone is useful in my daily life	1	2	3	4	5	6	7
PRA2. Using a mobile phone helps me to achieve things more quickly	1	2	3	4	5	6	7
PRA3. Using a mobile phone helps me to stay connected to people	1	2	3	4	5	6	7
PRA4. Using a mobile phone makes it easier to carry out my daily activities	1	2	3	4	5	6	7
Effort Expectancy							
EE1. Learning how to use mobile phones is easy for me	1	2	3	4	5	6	7
EE2. Learning how to use mobile applications is easy for me	1	2	3	4	5	6	7
EE3. My interaction with mobile phones is clear and understandable	1	2	3	4	5	6	7
EE4. I find mobile applications easy to use	1	2	3	4	5	6	7
EE5. It is easy for me to become skilful at using mobile phones	1	2	3	4	5	6	7
Culture-Specific Beliefs and Values							
CSBV1. The fact that a mobile phone supports technology-mediated meetings is an important element in its ultimate success or failure	1	2	3	4	5	6	7
CSBV2. My focus on technology-mediated meetings is a factor in the final outcome	1	2	3	4	5	6	7
CSBV3. I prefer technology (mobile)-mediated meetings rather than face-to-face meetings	1	2	3	4	5	6	7
Technological Culturation							
TC1. I find that due to the extent of travel for pleasure it is important to use technology	1	2	3	4	5	6	7
TC2. I find that reading foreign technology journals supports the use of technology	1	2	3	4	5	6	7

TC3. I find that training provided from foreign companies in my country is helpful for using technology	1	2	3	4	5	6	7
National IT development							
ND1. I find that the current demand for IT is high	1	2	3	4	5	6	7
ND2. I find that the current supply of IT is high	1	2	3	4	5	6	7
ND3. Government IT initiatives in policymaking are working well	1	2	3	4	5	6	7
ND4. I find current mobile tariffs acceptable	1	2	3	4	5	6	7
ND5. I find that currently there are no restrictions to using different mobile applications	1	2	3	4	5	6	7
Price Value							
PV1. Mobile phones are reasonably priced	1	2	3	4	5	6	7
PV2. Mobile applications are reasonably priced	1	2	3	4	5	6	7
PV3. My mobile phone is good value for money	1	2	3	4	5	6	7
PV4. Mobile applications are good value for money	1	2	3	4	5	6	7
PV5. At the current price, mobile phones provide good value	1	2	3	4	5	6	7
PV6. At the current prices, mobile applications provide good value	1	2	3	4	5	6	7
Behavioural Intention							
BI1. I intend to continue using mobile phones in the future	1	2	3	4	5	6	7
BI2. I will always try to use mobile phones in my daily life	1	2	3	4	5	6	7
BI3. I plan to continue to use mobile phones frequently	1	2	3	4	5	6	7
BI4. I envisage using mobile phones in the future	1	2	3	4	5	6	7
Habit							

HT1. The use of mobile phones has become a habit for me	1	2	3	4	5	6	7
HT2. I am addicted to using mobile phones	1	2	3	4	5	6	7
HT3. I must use mobile phones	1	2	3	4	5	6	7

Section 4: Perceptions about mobile adoption and usage

13. In your opinion, are there any challenges or problems facing mobile adoption and usage in your country?	
Yes ◯	No ◯
14. If your answer to question (12) is yes, please choose from the challenges listed below (you can choose more than one if applicable)	
a. Poor ICT infrastructure	◯
b. Lack of government regulations and policymaking	◯
c. High prices of tariffs by the provider	◯
d. High prices of mobile handsets	◯
e. High prices of mobile Internet by the provider	◯
f. Bad network connection	◯
g. Market monopoly by the provider	◯
h. Being restricted from certain mobile applications	◯
i. Ethical issues	◯
j. Cultural issues	◯
k. Other Please specify................................	

If you have any comments on mobile adoption and usage, please state them below

....
....

Thank you for taking the time to complete this questionnaire. If you have any queries, please do not hesitate to contact me by email or telephone

Nisreen Ameen nisreen.ameen@student.anglia.ac.uk

Tel: (0044)07402116688

Participant Information Sheet

Cambridge and Chelmsford

Cambridge Campus

East Road

Cambridge CB1 1PT

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ARAB USERS' ACCEPTANCE AND USE OF MOBILE PHONES: A CASE OF YOUNG USERS IN IRAQ, JORDAN AND UAE

This research is being conducted by Nisreen Ameen as part of a PhD programme run by Anglia Ruskin University over a five-year period. This study investigates the current level of technology adoption in the Arab countries and the factors affecting technology adoption (in particular, mobile adoption) from the view of telecommunication companies' consumers.

You are being invited to take part in a research project. Before you make a decision, it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully and discuss it with others if you wish. Ask me if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part. Thank you for reading this.

The research is being organised by Anglia Ruskin University. The research is funded by the researcher conducting this research. The results of the study will be analysed and used as the basis of a PhD thesis.

For further information, please contact me on;

Tel: (0044) 07402116688

Email: nisreen.ameen@student.anglia.ac.uk

Your Participation in the Research Project

As you are a resident in an Arab country, you are invited to take part in this research to provide your views regarding technology adoption in the Arab countries. It is up to you to decide whether or not to take part. If you do decide to take part, you will be given this information sheet to keep (and be asked to sign a consent form). You can still withdraw at any time. You do not have to give a reason.

If you agree to take part in this research, the researcher will provide you with a questionnaire which you will fill in. It will take approximately 10-15 minutes to complete the questionnaire. You will only be participating one time. The questions will enable closed questions to be given in relation to technology adoption in the Arab countries.

Whilst there are no immediate benefits for those people participating in the project, it is hoped that this work will contribute to the area of technology adoption in the Arab countries by providing new information about technology acceptance.

All the information collected about you during the course of the research will be kept strictly confidential. You will not be identified in any reports or publications. Your personal information will not be revealed during any part of this research. All participants' names will be coded. All paper copies will be kept locked in a filing cabinet.

YOU WILL BE GIVEN A COPY OF THIS TO KEEP,

TOGETHER WITH A COPY OF YOUR CONSENT FORM

Anglia Ruskin University

Cambridge Chelmsford Peterborough

Participant Consent Form

Cambridge and Chelmsford

Cambridge Campus

East Road

Cambridge CB1 1PT

Tel: 0845 196 2568

Int:+44(0)122336321

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NAME OF PARTICIPANT:

Title of the project: **ARAB USERS' ACCEPTANCE AND USE OF MOBILE PHONES: A CASE OF YOUNG USERS IN IRAQ, JORDAN AND UAE**

Main investigator and contact details:

Nisreen Ameen

Tel: (0044) 07402116688

Email: nisreen.ameen@student.anglia.ac.uk

1. I agree to take part in the above research. I have read the Participant Information Sheet which is attached to this form. I understand what my role will be in this research, and all my questions have been answered to my satisfaction.

2. I understand that I am free to withdraw from the research at any time, for any reason and without prejudice.

3. I have been informed that the confidentiality of the information I provide will be safeguarded.

4. I am free to ask any questions at any time before and during the study.

5. I have been provided with a copy of this form and the Participant Information Sheet.

Data Protection: I agree to the University[19] processing personal data which I have supplied. I agree to the processing of such data for any purposes connected with the Research Project as outlined to me.

Name of participant (print)………………………….

Signed………………..….Date………………

Name of witness (print)……………………………..Signed

………………..….Date………………

YOU WILL BE GIVEN A COPY OF THIS FORM TO KEEP

If you wish to withdraw from the research, please complete the form below and return to the main investigator named above.

Title of the project: **ARAB USERS' ACCEPTANCE AND USE OF MOBILE PHONES: A CASE OF YOUNG USERS IN IRAQ, JORDAN AND UAE**

I WISH TO WITHDRAW FROM THIS STUDY

Signed: _________________________________ Date: ____________________

[19] "The University" includes Anglia Ruskin University and its partner colleges

Appendix-M: Final Questionnaire, Participant Information Sheet and Participant Consent Form in Arabic

القسم الاول: المعلومات الشخصية

1. الدولة التي ولدت فيها	
2. منذ متى و انت تعيش في هذا البلد؟	
3. الفئة العمرية ؟	
ii. i .اقل من 18 ◯	i. 22-18 ◯
iv. 29-23 ◯	iii. اكثر من 29 ◯
4. الجنس	
i.ذكر ◯	ii. انثى ◯
5. التحصيل العلمي ؟	
ii. شهادة الدكتوراه ◯	i. شهادة الماجستير ◯
iv. .iiiشهادة البكالوريوس ◯	iii. دبلوم ◯
vi. المدرسة الاعدادية ◯	v. غير ذلك (يرجى التحديد) ◯ ____
6. يرجى إعطاء المعلومات حول الكفاءة اللغوية لديك (لكل مما يلي فيما يخص اللغة العربية و الانكليزية) أدناه: يمكنني قراءتها يمكنني كتابتها يمكنني التحدث بها بسهولة بسهولة بسهولة العربية ◯ ◯ ◯ الانكليزية ◯ ◯ ◯	
7. الحالة الوظيفية – نوعية العمل ؟	
ii. اعمل ◯	i. اعمل لحسابي الخاص ◯
iv. لا اعمل و ابحث عن عمل ◯	iii. لا اعمل و لا ابحث عن عمل ◯
vi. طالب| طالبة ◯	v. أخرى (يرجى التحديد) ◯ ____
8. الرجاء اعطاء المعلومات المناسبة حول دخلك السنوي (الراتب + الموارد الاخرى): مستوى دخلي السنوي هو:	
ii. اقل من $10,000 ◯	i. $10,000 الى $19,000 ◯
iv. $20,000 الى $29,000 ◯	iii. $30,000 الى $39,000 ◯
vi. $ 40,000 الى $49,000 ◯	v. اكثر من $50,000 ◯

القسم الثاني: استخدام الهواتف الجوالة

9. هل تستعمل هاتفا جوالا (موبايل)؟
i. نعم ◯   ii . لا ◯
10. إذا كانت الإجابة بنعم، منذ متى وانتتقوم باستخدامالهاتف المحمول
ii. اقل من 3 سنوات ◯   i. اقل من 5 سنوات ◯
iv. اقل من 7 سنوات ◯   iii. اقل من 10 سنوات ◯
v. اكثر من 10 سنوات ◯
11. اذا كان لديك هاتفا محمولا, ما هو نوع هاتفك المحمول؟ ______________________
12. إذا كنت تستخدمالهواتف المحمولة، يرجى اختيارنسبة تكرارالاستخدام لكلمما يلي:

عدة مرات في اليوم الواحد	كل يوم	معظم الايام	بعض الايام	من حين الى حين	تقريبا ابدا	ابدا	
							أ. هاتفك الجوال (لاجراء المكالمات)
							ب. الرسائل القصيرة
							ج. الانترنيت عبر الهاتف النقال
							د. العاب
							و. البريد الالكتروني في هاتفك
							ز. تطبيقات المراسلة في هاتفك الجوال (مثل: فايبر,سكايب او واتس اب)
							ر. شبكات التواصل الاجتماعي عبر هاتفك الجوال
							ه. الخدمات المصرفية عبر الهاتف الجوال
							ي. التجارة الالكترونية عبر الهاتف الجوال

القسم الثالث:البيانات المتعلقة باستخدام الهاتف النقال

يرجى الإشارةالى موافقتك او عدم الموافقة معالعبارات التاليةحولاستخدام الهواتف النقالةعن طريق تحديد الاستجابةالمناسبة؛

1= لا اوافق بشدة 2. لا اوافق تماما 3. لا اوافق قليلا 4. محايد 5. اوافق قليلا 6. اوافق تماما 7. اوافق بشدة

الظروف المساعدة							
FC1. لدي الموارد اللازمة لاستخدام الهواتف المحمولة	1	2	3	4	5	6	7
FC2. لدي الموارد اللازمة لاستخدام تطبيقات الهاتف المحمول	1	2	3	4	5	6	7

FC3. لدي المعرفة اللازمة لاستخدام الهواتف المحمول	1	2	3	4	5	6	7
FC4. لدي المعرفة الازمة لاستخدام تطبيقات الهاتف المحمول	1	2	3	4	5	6	7
FC5. هاتفي المحمول متوافق مع التقنيات التكنولوجية الاخرى التي استخدمها	1	2	3	4	5	6	7
FC6. يمكنني الحصول على مساعدة من الآخرين عندما يكون لدي صعوبات في استخدام الهواتف المحمولة	1	2	3	4	5	6	7
التمتع							
Enj1. استخدام الهواتف المحمولة هو متعة	1	2	3	4	5	6	7
Enj2. استخدام الهواتف الجوالة ممتع	1	2	3	4	5	6	7
Enj3. استخدام الهواتف المحمولة مسلي جدا	1	2	3	4	5	6	7
التاثير الاجتماعي							
SI1. الناس المهمين لدي يعتقدون انني يجب ان استخدم الهاتف المحمول	1	2	3	4	5	6	7
SI2. الناس الذين لهم تاثير على سلوكي يعتقدون انني يجب ان استخدم الهاتف المحمول	1	2	3	4	5	6	7
SI3. الناس الذين اقدر ارائهم يفضلون ان استخدم الهواتف المحمولة	1	2	3	4	5	6	7
ادراك الميزة ذات الصلة (الفائدة)							
PRA1. اجد ان الهاتف المحمول مفيد في حياتي اليومية	1	2	3	4	5	6	7
PRA2. استخدام الهاتف المحمول يساعدني على تحقيق الأشياء بسرعة أكبر	1	2	3	4	5	6	7
PRA3. استخدام الهاتف المحمول يساعدني على ان ابقى متصلا بالناس	1	2	3	4	5	6	7
PRA4. استخدام الهاتف المحمول يسهل تنفيذي للنشاطات اليومية	1	2	3	4	5	6	7
الجهد المتوقع							
EE1. تعلم كيفية استخدامالهواتف المحمولةسهلا بالنسبة لي	1	2	3	4	5	6	7
EE2. تعلم كيفية استخدام تطبيقات الهاتف المحمول سهل بالنسبة لي	1	2	3	4	5	6	7
EE3. تفاعلي مع الهواتف المحمولة واضح و مفهوم	1	2	3	4	5	6	7
EE4. اجد ان تطبيقات الهاتف المحمول سهلة الاستخدام	1	2	3	4	5	6	7

EE5. من السهل بالنسبة لي ان اصبح ماهرا في استخدام الهواتف المحمولة	1	2	3	4	5	6	7
المعتقدات و القيم المحددة في الثقافة							
CSBV1. حقيقة ان الهاتف المحمول يدعم الاجتماعات او اللقاءات التي تتوسطها التكنولوجيا عنصر مهم في نجاحه او فشله في نهاية المطاف	1	2	3	4	5	6	7
CSBV2. تركيزي على الاجتماعات التي تتوسطها التكنولوجيا هو عامل في النتيجة النهائية	1	2	3	4	5	6	7
CSBV3. افضل الاجتماعات او اللقاءات التي تتوسطها التكنولوجيا (الموبايل) و ليس اللقاءات التي تتم وجها لوجه	1	2	3	4	5	6	7
التثقيف التكنولوجي							
TC1. أجد أنه نظرا لكثرة السفر للمتعة من المهم استخدام التكنولوجيا	1	2	3	4	5	6	7
TC2. أجد أن القراءة في مجلات التكنولوجيا الأجنبيةتدعم استخدام التكنولوجيا	1	2	3	4	5	6	7
TC3. أجد أن التدريب المقدم من الشركات الأجنبية في بلدي مفيد لاستخدام التكنولوجيا	1	2	3	4	5	6	7
التنمية الوطنية لتكنولوجيا المعلومات							
ND1. أجد أن الطلب الحالي على تكنولوجيا المعلومات عالي	1	2	3	4	5	6	7
ND2. اجد ان التزويد الحالي بتكنولوجيا المعلومات عالي	1	2	3	4	5	6	7
ND3. المبادرات الحكومية في صنع بوليصات لتكنولوجيا المعلوماتتعمل بشكل جيد	1	2	3	4	5	6	7
ND4. اجد ان التعريفة الحالية للهاتف المحمول مقبوله	1	2	3	4	5	6	7
ND5. أجد أنه في الوقت الراهن لا توجد قيودعلى استخدام التطبيقات المختلفة للهواتف المحموله	1	2	3	4	5	6	7
السعر							
PV1. يتم تسعير الهواتف المحمولة بشكل معقول	1	2	3	4	5	6	7
PV2. يتم تسعير تطبيقات هاتف المحمول بشكل معقول	1	2	3	4	5	6	7
PV3. هاتفي المحمول هو قيمة جيدة مقابل المال	1	2	3	4	5	6	7
PV4. تطبيقات الهاتف المحمول هي ذات قيمة جيدة مقابل المال	1	2	3	4	5	6	7
PV5. بسعره الحالي, الهاتف المحمول يقدم قيمة جيدة	1	2	3	4	5	6	7

PV6. بسعرها الحالي, تطبيقات الهاتف المحمول تقدم قيمة جيدة	1	2	3	4	5	6	7
سلوك النية							
BI1. أنويالاستمرار في استخدام الهواتف المحمولة في المستقبل	1	2	3	4	5	6	7
BI2. سوف احاول دائما ان استخدم الهواتف المحمولة في حياتي اليومية	1	2	3	4	5	6	7
BI3. اخطط لاستخدام الهواتف المحموله تكرارا	1	2	3	4	5	6	7
BI4. أتصوراستخدام الهواتف النقالة في المستقبل	1	2	3	4	5	6	7
العادة							
HT1. استخدام الهاتف المحمول اصبح عادة عندي	1	2	3	4	5	6	7
HT2. انا مدمن على استخدام الهاتف المحمول	1	2	3	4	5	6	7
HT3. يجب ان استخدم الهاتف الجوال	1	2	3	4	5	6	7

القسم الرابع:الاراء و التصورات حول اعتماد واستخدام المحمول

13. في رأيك ، هل هناك أي تحديات أو مشاكل تواجه اعتماد و استخدام الهاتف المحمول في بلدك؟	
نعم ○	لا ○
14. إذا كانت إجابتك على السؤال (12) هي نعم، يرجى الاختيار من بين العوائق/ المشاكل الواردة أدناه (يمكنك اختيار أكثر من واحد إنوجد)	
ا. ضعف البنية التحتية لتكنولوجيا المعلومات والاتصالات	○
ب.عدم وجود أنظمة و قوانين حكومية ورسم السياسات /البوليصات الخاصة	○
ج . ارتفاع سعر التعريفة من قبل المزود	○
د. ارتفاع اسعار اجهزة الهواتف المحمولة	○
ر . ارتفاع أسعار الإنترنت عبر الهاتف النقال من قبل المزود	○
ه . اتصال الشبكة سيئ	○
و . احتكار السوق من قبل المزود	○
ز. منع استخدام تطبيقات معينة في الهاتف الجوال	○
ك. قضايا اخلاقية	○
م. قضايا ثقافية	○
ي. اخرى يرجى التحديد..	○

اذا كان لديك أي تعليقات على اعتماد و استخدام الهاتف المحمول، يرجى ذكرها أدناه

....
....

....
....

اشكركم على اخذ الوقت لاستكمال هذا الاستبيان. اذا كان لديكم اي استفسار...لا تترددوا في الاتصال بي عن طريق البريد الالكتروني او الهاتف:

الهاتف: 07402116688 (0044)

البريد الالكتروني: nisreen.ameen@student.anglia.ac.uk

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استمارة استبيان

عنوان المشروع: : تقبل و استخدام المواطنين في البلدان العربية للهواتف الجوالة: دراسة عن المستخدمين الشباب في العراق والأردن والإمارات العربية المتحدة

تقوم الباحثة (**نسرين امين**) بتنفيذ هذا البحث الميداني كجزء متطلبات شهادة الدكتوراه التي تشرف عليها جامعةAnglia Ruskin Universityلمدة الدراسة 5 سنوات. هذه الدراسة تبحث المستوى الحالي في اعتماد التكنولوجيا في الشرق الاوسط و العوامل المؤثرة عليها (الهاتف المحمول بشكل خاص) من وجهة نظر العملاء.

تدعوك الباحثة للمشاركة في هذا الاستبيان الميداني . قبل اتخاذ اي قرار بصدد المشاركة، من المهم بالنسبة لك أن تفهم لماذا يتم القيام بهذا البحث وما سيترتب عليه.يرجى أخذ الوقت لقراءة المعلومات التالية بعناية ومناقشتها مع الآخرين إذا كنت ترغب في ذلك .بامكانك ايضا ان تسألني إذا كان هناك أي شيء غير واضح أو إذا كنت ترغب في المزيد من المعلومات .خذ وقتك لتقررما إذا كنت ترغب في المشاركة .شكرا لهذه القراءة.

تم تنظيم البحث من قبل جامعة Anglia Ruskin University .يتم تمويل هذا البحث من قبل الباحث المختص وسيتم تحليل نتائج الدراسة لتكون اساسا لأطروحة دكتوراه.

للمزيد من المعلومات, يرجى الاتصال على:
الهاتف: 07402116688 (0044)
البريد الإلكتروني:nisreen.ameen@student.anglia.ac.uk

مشاركتك في مشروع البحث

بما انك مقيما في بلد عربي، فأنت مدعو للمشاركة في هذا البحث الميداني لتقديم وجهة نظرك حول الاعتماد التكنولوجي في الشرق الأوسط .والقرار النهائي بصدد المشاركة متروك لك. علماإذا لم ترغببالمشاركة، حينها سيتم اعطاؤك ورقة المعلومات هذه للحفاظ عليها .لا يزال بإمكانك الانسحاب في أي وقت و بدون اعطاء اي سبب.

إذا وافقت على المشاركة في هذا البحث، فإن الباحث سيوفر لك الاستبيان التي سيتم ملؤه .سوف يستغرق ذلك حوالي 10 الى 15 دقيقة لإتمام الاستبيان.ستقوم بالمشاركة لمرة واحدة فقط. الاستبيانسيوفر الأسئلة المغلقة التي يتعين تقديمها و المتعلقة بتبني التكنولوجيا في منطقة الشرق الأوسط.

في حين لا توجد منافع فورية لهؤلاء الناس المشاركين في المشروع، من المؤمل أن هذا العمل سيسهم في مجال اعتماد التكنولوجيا في الدول العربية من خلال توفير معلومات جديدة عن قبول التكنولوجيا.

وسيتم حفظ جميع المعلومات التي تم جمعهاعنك أثناء البحث بسرية تامة.لن يتم التعرف عليك في أي تقارير أومنشورات .لن يتم كشف المعلومات الشخصية الخاصة بك خلال أي جزء من هذا البحث .سيتم ترميزأسماء جميع المشاركين.وستبقى جميع النسخ الورقية محفوظة في خزانة الملفات.

سوف تحصل على نسخة من هذه الورقة و يمكنك الاحتفاظ بها مع ورقة موافقة المشترك

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استمارة موافقة المشترك

اسم المشترك:

عنوان المشروع: تقبل و استخدام المواطنين في البلدان العربية للهواتف الجوالة: دراسة عن المستخدمين الشباب في العراق والأردن والإمارات العربية المتحدة

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1. أوافق على المشاركة في البحث المذكورأعلاه. لقد قرأت صفحة معلومات المشترك المرفقه بهذه الأستمارة. وأنا على دراية بما سيكون دوري في هذا البحث، كما تمّ الإجابة على جميع أسئلتي بصورة مُرضية.

2. أدرك بأنني حر في الانسحاب من البحث في أي وقت كان، لأي سبب من الأسباب وبدون سبب معين.

3. لقد تم ابلاغي ان المعلومات التي ستقدم في استمارة الاستبيان سيكون قيد الحفاظ.

4. امتلك الحرية الكاملة في طرح الاسئلة مها كانت نوعية الاسئلة و في اي وقت قبل او بعد البحث

5. تم تزويدي نسخة من هذه الأستمارة و كذلك ورقة معلومات المشترك.

حماية البيانات: أنني أوافق على معالجة البيانات الشخصية [1]الجامعة التي تزودت بها. أوافق على معالجة مثل هذه البيانات لأية أغراض متعلقة بمشروع البحث على النحو الذي تم توضيحها.

اسم المشترك (طباعة) .... التوقيع: .... التاريخ: ....

اسم الشاهد (طباعة) .... التوقيع: .... .التاريخ : ……………………..

سوف تحصل على نسخة من هذهالأستمارة للإحتفاظ بها

إذا كنت ترغب في الانسحاب من البحث، يرجى ملء الأستمارة أدناه والعودة الى الباحثه الرئيسية المذكوره أعلاه.

عنوان المشروع:تقبلو استخدام المواطنين في البلدان العربية للهواتف الجوالة: دراسة عن المستخدمين الشباب في العراق والأردن والإمارات العربية المتحدة

أرغب في الانسحاب من هذه الدراسة

التوقيع: ______________________________ التاريخ: _________________________

Appendix-N: Assessing the Moderators' Effects

Testing the continuous moderators' effects should be conducted in a different way to that of the categorical moderators. The continuous moderators' effect is tested with the interaction term (Hair et al., 2014), using the product indicator approach by multiplying each (mean-centred) item of the exogenous variable with each item of the moderator variable. However, if the exogenous variable is formative, the two-stage approach is used as described by Hair et al. (2014). This approach involves two stages. First, the main effects are tested and the latent variable's scores are obtained. Second, these scores are multiplied by the moderator variable to present the interaction in a single item measure (Hair et al., 2014).

The procedure of testing the moderators' effect is influenced by the type of moderator and the type of exogenous variable in the relationship. According to Hair et al. (2014), the effect of the categorical moderator is better assessed using multigroup analysis between the groups. There are two main types of approach to multigroup analysis. The first is the parametric approach. Hair et al. (2014, p.248) proposed a formula to conduct MGA using the *t* value if the standard errors are equal. The formula is as follows:

$$t = \frac{\left| p^{(1)} - p^{(2)} \right|}{\sqrt{\frac{\left(n^{(1)}-1\right)^2}{(n^{(1)}+n^{(2)}-2)} \cdot se\left(p^{(1)}\right)^2 + \frac{\left(n^{(2)}-1\right)^2}{(n^{(1)}+n^{(2)}-2)} \cdot se\left(p^{(2)}\right)^2} \cdot \sqrt{\frac{1}{n^{(1)}} + \frac{1}{n^{(2)}}}}.$$

where

The t value must be larger than the critical value from a t distribution with $n^{(1)} + n^{(2)} - 2$ degrees of freedom in order to reject the null hypothesis of equal path coefficients (Hair et al., 2014).

The path coefficients are denoted as $p^{(g)}$ (with g as a group index), The number of observations in a group is donated as $n^{(g)}$.

The standard errors of the parameters as resulting from bootstrapping as $se(p^{(g)})^2$.

If the standard errors are unequal, Hair et al. (2014, p.248) proposed the application of the Smith-Satterthwaite test, which uses the following formula:

$$t = \frac{\left| p^{(1)} - p^{(2)} \right|}{\sqrt{\frac{(n^{(1)} - 1)}{n^{(1)}} \cdot se\left(p^{(1)}\right)^2 + \frac{\left(n^{(2)} - 1\right)}{n^{(2)}} \cdot se\left(p^{(2)}\right)^2}}.$$

The path coefficients are denoted as $p^{(g)}$(with g as a group index).

The number of observations in a group is donated as $n^{(g)}$.

This procedure requires three main values to input for each group: the sample size for each group, the path coefficient for each group through obtaining separate PLS path models for each group, and finally, the standard errors of the parameter estimates for each group (Hair et al., 2014). The test for equality of standard errors proposed by Hair et al. (2014) in an Excel sheet is used to reveal whether the standard errors are equal. If the p value is 0.05 or lower or 0.95 or higher, the results from equal standard errors are assumed (Hair et al., 2014). Although the parametric approach is the most widely used approach, this test has a limitation of assuming that data follow a normal distribution, which is against the nature of PLS (Hair et al., 2014). Therefore, Sarstedt et al. (2011) proposed an alternative method, the non-parametric confidence set approach. This approach overcomes the limitation of the parameter approach, as it is based on bootstrapping. The PLS-MGA is based on estimating the path model for each group which, in turn, is assessed based on a separate bootstrap analysis (Henseler, 2010). The analysis in this approach relies on assessing the observed distribution of the bootstrap outcomes instead of making distributional assumptions (Henseler, 2010). The centred bootstrap estimates of the groups are compared, then the difference between the groups is divided by the total number of bootstrap samples to indicate the probability that the second group is greater than the first group, and is evaluated using the *p* value (Henseler, 2010). *P* values of 0.05 or lower or 0.95 or higher indicate significant differences between the paths in the groups.

PLS-MGA is a non-parametric approach and includes a set of different techniques to compare PLS model estimates (Hair et al., 2014). It is important to note that each of the methods explained that can be used to test the moderating effects has its own limitations in relation to this research. The product indicator interaction approach, although it can test the effects of continuous moderator variables, cannot be used with formative exogenous constructs. The two-stage interaction approach can be used with formative exogenous constructs. However, there are still some issues associated with using this approach for testing the moderating effects on formative constructs (Henseler and Fassott, 2010). The parametric multigroup analysis assumes a normal distribution of the data, which is not the case in this research.

Appendix-O: Practical Issues and Limitations Related to Partial Least Squares-Structural Equation Modelling (PLS-SEM)

Although PLS-SEM was selected as the most suitable technique for this research, it has its own limitations and practical issues that must be taken into consideration.

Theory confirmation: Westland (2007) explained that PLS can be used for model predictions which are plausible instead of being confirmed (Westland, 2007). PLS suffers from the lack of overall fit statistics, estimation could be biased and it does not show where additional observations need to be collected (Westland 2007). The results of PLS-SEM are valid mainly for predictive purposes (Hair et al., 2006). Nevertheless, previous studies have stated that PLS is suitable for both exploratory and confirmatory research (e.g., Gefen et al., 2000; Urbach and Ahlemann, 2010).

Causality: PLS-SEM cannot be used when there are causal loops in the structural models (Hair et al., 2014).

Collinearity: Collinearity is an issue with PLS-SEM and must be handled well (Henseler et al., 2009). Collinearity exists when high correlations exist between two formative indicators. Consequently, it appears to have an adverse effect on the estimation of weights and their statistical significance (Hair et al., 2014). Söllner et al. (2010, p.74) stated, “Multicollinearity arises from conceptual redundancies and can lead to the misinterpretation of factors as unimportant or invalid facets of the construct’s domain”. Therefore, the issue of collinearity must be handled well by researchers in order to reach valid conclusions in terms of their findings.

Appendix-P: Common Method Variance

Common Method Variance (CMV) is a common problem in IS research (Woszczynski and Whitman, 2004). As this research was conducted at a single time period in each country with a single type of respondent (young users of mobile phones) and using a single method of data gathering, CMV had to be tested, as it became a concern. Several remedies have been recommended in the literature, for example, factoring for social desirability including more than one type of respondent and including Confirmatory Factor Analysis that considers common method bias (Woszczynski and Whitman, 2004), or statistical remedies such as Harman’s test and the marker variable technique (Craighead et al., 2011).

With reference to Podsakoff et al.’s (2003) recommendations for procedural remedies controlling common method biases, three out of the five procedural remedies were considered. Due to the specific nature of this research, the measurement of the predictor and criterion variables could not be separated. Also, having a time lag between the measurement of the predictor and the criterion variables (following Venkatesh et al.’s (2012) study) was not feasible, as the researcher distributed the questionnaires to unknown respondents and it was not possible to reach them again after a certain period of time as indicated by Woszczynski and Whitman (2004). However, the researcher ensured the protection of the respondents’ anonymity and explained that there was no right or wrong answer and the main purpose of the questionnaire was to understand their perceptions rather than evaluating them. In addition, the scale items were carefully constructed and largely adopted from previous well-known studies. In addition, in Section Three of the questionnaire, the order of the predictor and criterion variables was counterbalanced up to an acceptable level. Although counterbalancing has many advantages in preventing some sources of common method bias, the logical flow of the order of questions must not be overly disturbed.

As not all procedural remedies recommended by Podsakoff et al. (2003) could be implemented, statistical remedies were also used in this research. With reference to the statistical remedies stated in Podsakoff et al.'s (2003) study, Harman's one-factor test has been widely used in the existing body of literature to determine CMV. Harman's single-factor test was used as the first test for CMV in this study. In Harman's test, researchers inspect whether a single factor explains a high variance or "one general factor does account for a covariance between the measures" (Chang et al., 2010, p.180). If this does not occur, CMV is not seen as an issue in the research. Harman's test has some limitations. Podsakoff et al. (2003) explained that it is not common for one factor to appear, rather multiple factors. Nevertheless, the decision was taken that if CMV issues appeared in the Harman's test results, the marker variable technique would be used. This statistical remedy has the ability to overcome the problems associated with Harman's test. The marker variable test involves adding a new marker variable which is irrelative to the variables in the research (Malhorta et al., 2006). The marker variable method for controlling CMV can be conducted by choosing marker indicators which are not part of the model. The mean correlation between the constructs' indicators and the marker indicators are calculated. Then, the baseline model is estimated without including the controls for CMV. The model with the marker variable is analysed using the squared correlations between the marker variable and the other constructs in the model. If there is no relationship between the chosen marker variable and any other variable in the model, there will not be any significant correlations. The highest correlation between the marker variable and one of the other constructs should be squared to find the maximum percentage of shared variance. The marker variable method has its own limitations. Podsakoff et al. (2003) held major criticisms against this technique, as it is unable to control for the main reasons that make CMV exist as well as other conceptual and empirical problems which were highlighted in their research (Podsakoff et al., 2003).

Appendix-Q: Results of the Analysis of the Data from Iraq

Results of Assessment of Mann-Whitney-U-test for Testing Non-response Bias for the Iraqi Sample

	PRA	FC	Enj	SI	EE	CSBV
Mann-Whitney U	1045.000	978.000	978.500	1102.500	1064.500	981.500
Wilcoxon W	2173.000	2106.000	2253.500	2230.500	2192.500	2256.500
Z	-.948	-1.425	-1.424	-.525	-.800	-1.401
Asymp. Sig. (2-tailed)	.343	.154	.155	.599	.424	.161

	TC	ND	PV	BI	HT	USE
Mann-Whitney U	1030.500	1133.000	1164.500	1151.500	1032.000	1144.000
Wilcoxon W	2305.500	2408.000	2292.500	2426.500	2160.000	2419.000
Z	-1.047	-.304	-.076	-.171	-1.036	-.224
Asymp. Sig. (2-tailed)	.295	.761	.939	.865	.300	.823

Grouping variable: Respondent (1=early, 2=late)

Descriptive Statistics for Iraq

The Country the respondents were born in

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Iraq	398	100.0	100.0	100.0

The Number of Years the Respondents spent in Iraq

Number of years		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	3	.8	.8	.8
	2.00	10	2.5	2.5	3.3
	3.00	11	2.8	2.8	6.0
	4.00	7	1.8	1.8	7.8
	5.00	5	1.3	1.3	9.0
	6.00	5	1.3	1.3	10.3
	7.00	3	.8	.8	11.1
	8.00	3	.8	.8	11.8
	9.00	1	.3	.3	12.1
	10.00	6	1.5	1.5	13.6

11.00	1	.3	.3	13.8
12.00	4	1.0	1.0	14.8
13.00	1	.3	.3	15.1
14.00	2	.5	.5	15.6
15.00	6	1.5	1.5	17.1
16.00	3	.8	.8	17.8
17.00	1	.3	.3	18.1
18.00	31	7.8	7.8	25.9
19.00	46	11.6	11.6	37.4
20.00	34	8.5	8.5	46.0
21.00	30	7.5	7.5	53.5
22.00	25	6.3	6.3	59.8
23.00	8	2.0	2.0	61.8
24.00	20	5.0	5.0	66.8
25.00	36	9.0	9.0	75.9
26.00	15	3.8	3.8	79.6
27.00	25	6.3	6.3	85.9
28.00	31	7.8	7.8	93.7

	29.00	25	6.3	6.3	100.0
	Total	398	100.0	100.0	

Age of Respondents in Iraq

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18-22	186	46.7	46.7	46.7
	23-29	212	53.3	53.3	100.0
	Total	398	100.0	100.0	

Gender of Respondents in Iraq

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	203	51.0	51.0	51.0
	Female	195	49.0	49.0	100.0
	Total	398	100.0	100.0	

Results of Education Level of Respondents in Iraq

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	High School	85	21.4	21.4	21.4
	Diploma	44	11.1	11.1	32.4
	Bachelor Degree	230	57.8	57.8	90.2
	Master Degree	28	7.0	7.0	97.2
	PhD Degree	11	2.8	2.8	100.0
	Total	398	100.0	100.0	

Results of Employment Status of Respondents in Iraq

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Employed	172	43.2	43.2	43.2
	Self-employed	24	6.0	6.0	49.2
	Unemployed and currently looking for work	19	4.8	4.8	54.0
	Unemployed and not looking for work	13	3.3	3.3	57.3
	Student	169	42.5	42.5	99.7
	Other	1	.3	.3	100.0

	Total	398	100.0	100.0	

Results of Income Level of Respondents in Iraq

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than $10,000	295	74.1	74.1	74.1
	$10,000 to $19,000	57	14.3	14.3	88.4
	$20,000 to $29,000	26	6.5	6.5	95.0
	$30,000 to $39,000	9	2.3	2.3	97.2
	$40,000 to $49,000	4	1.0	1.0	98.2
	$50,000 or more	7	1.8	1.8	100.0
	Total	398	100.0	100.0	

Results of Assessment of Arabic Language Reading Fluency in the Iraqi Sample

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	398	100.0	100.0	100.0

Results of Assessment of Arabic Language Writing Fluency in the Iraqi Sample

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	385	96.7	96.7	96.7
	No	13	3.3	3.3	100.0
	Total	398	100.0	100.0	

Results of Assessment of Arabic Language Speaking Fluency in the Iraqi Sample

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	361	90.7	90.7	90.7
	No	37	9.3	9.3	100.0
	Total	398	100.0	100.0	

Results of Assessment of English Language Reading Fluency in the Iraqi Sample

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	308	77.4	77.4	77.4
	No	90	22.6	22.6	100.0
	Total	398	100.0	100.0	

Results of Assessment of English Language Writing Fluency in the Iraqi Sample

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	253	63.6	63.6	63.6
	No	145	36.4	36.4	100.0
	Total	398	100.0	100.0	

Results of Assessment of English Language Speaking Fluency in the Iraqi Sample

	Frequency	Percent	Valid Percent	Cumulative Percent

	Yes	236	59.3	59.3	59.3
Valid	No	162	40.7	40.7	100.0
	Total	398	100.0	100.0	

Results of Asessment of Mobile Phone Use for the Iraqi Sample

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	398	100.0	100.0	100.0

Results of Asessment of Experience in Using Mobile Phone for the Iraqi Sample

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than 3 years	44	11.1	11.1	11.1
	Less than 5 years	69	17.3	17.3	28.4
	Less than 7 years	81	20.4	20.4	48.7
	Less than 10 years	87	21.9	21.9	70.6
	More than 10 years	117	29.4	29.4	100.0
	Total	398	100.0	100.0	

Summary for Types of Mobile Phones Used by Respondents in Iraq

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		6	1.5	1.5	1.5
	BLACKBER	2	.5	.5	2.0
	GENERAL	1	.3	.3	2.3
	HTC	27	6.8	6.8	9.0
	iPHONE	149	37.4	37.4	46.5
	LENOVO	20	5.0	5.0	51.5
	LG	2	.5	.5	52.0
	NOKIA	28	7.0	7.0	59.0
	SAMSUNG	138	34.7	34.7	93.7
	SONY	25	6.3	6.3	100.0
	Total	398	100.0	100.0	

Summary for Use of Mobile Applications by Respondents in Iraq

	Minimum	Maximum	Mean	Std. Deviation	Variance
CALLS	2	7	6.09	1.073	1.150
SMS	1	7	5.62	1.466	2.150
MOBINT	1	7	5.55	1.719	2.954
GAMES	1	7	4.67	2.118	4.484
MOBEMAIL	1	7	4.42	2.224	4.944
MOBAPPS	1	7	5.38	1.807	3.264
MOBSM	1	7	5.08	2.020	4.082
MOBBANK	1	3	1.25	.532	.283
MCOMMERCE	1	3	1.19	.449	.202

Results of Descriptive Statistics for Likert Scale Items for the Iraqi Sample

	Minimum	Maximum	Mean	Std. Deviation	Variance
FC1	1.00	7.00	5.09	1.99	3.97
FC2	1.00	7.00	4.95	1.86	3.46
FC3	1.00	7.00	5.48	1.66	2.74
FC4	1.00	7.00	5.33	1.75	3.06

FC5	1.00	7.00	5.21	1.82	3.33
FC6	1.00	7.00	5.21	1.71	2.92
Enj1	1.00	7.00	4.82	1.98	3.92
Enj2	1.00	7.00	5.06	1.78	3.17
Enj3	1.00	7.00	4.92	1.82	3.31
SI1	1.00	7.00	5.25	1.71	2.94
SI2	1.00	7.00	5.00	1.69	2.84
SI3	1.00	7.00	5.04	1.75	3.05
PRA1	1.00	7.00	5.74	1.64	2.70
PRA2	1.00	7.00	5.88	1.47	2.15
PRA3	1.00	7.00	5.75	1.59	2.53
PRA4	1.00	7.00	5.65	1.56	2.42
EE1	1.00	7.00	5.59	1.62	2.64
EE2	1.00	7.00	5.54	1.55	2.41
EE3	1.00	7.00	5.49	1.52	2.32
EE4	1.00	7.00	5.52	1.60	2.57
EE5	1.00	7.00	5.54	1.64	2.69
CSBV1	1.00	7.00	5.25	1.81	3.29
CSBV2	1.00	7.00	5.06	1.75	3.07

CSBV3	1.00	7.00	4.65	1.97	3.86
TC1	1.00	7.00	5.61	1.61	2.60
TC2	1.00	7.00	5.37	1.67	2.79
TC3	1.00	7.00	5.19	1.74	3.05
ND1	1.00	7.00	5.46	1.67	2.78
ND2	1.00	7.00	5.42	1.59	2.53
ND3	1.00	7.00	4.95	1.72	2.95
ND4	1.00	7.00	4.98	1.72	2.96
ND5	1.00	7.00	4.92	1.70	2.90
PV1	1.00	7.00	5.06	1.82	3.31
PV2	1.00	7.00	5.39	1.73	3.00
PV3	1.00	7.00	5.42	1.68	2.81
PV4	1.00	7.00	5.27	1.71	2.93
PV5	1.00	7.00	5.26	1.71	2.93
PV6	1.00	7.00	4.76	1.72	2.96
BI1	1.00	7.00	5.86	1.62	2.63
BI2	1.00	7.00	5.73	1.53	2.34
BI3	1.00	7.00	5.62	1.54	2.36
BI4	1.00	7.00	5.59	1.67	2.80

HT1	1.00	7.00	5.60	1.74	3.03
HT2	1.00	7.00	4.91	1.87	3.49
HT3	1.00	7.00	5.37	1.78	3.17

Summary of Descriptive Statistics on Iraqi Respondents' Agreement

Whether Challenges Facing Mobile Phone Adoption and Use Exist

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	240	60.3	60.3	60.3
	No	158	39.7	39.7	100.0
	Total	398	100.0	100.0	

Summary of Challenges Facing Mobile Phone Adoption and Use in Iraq

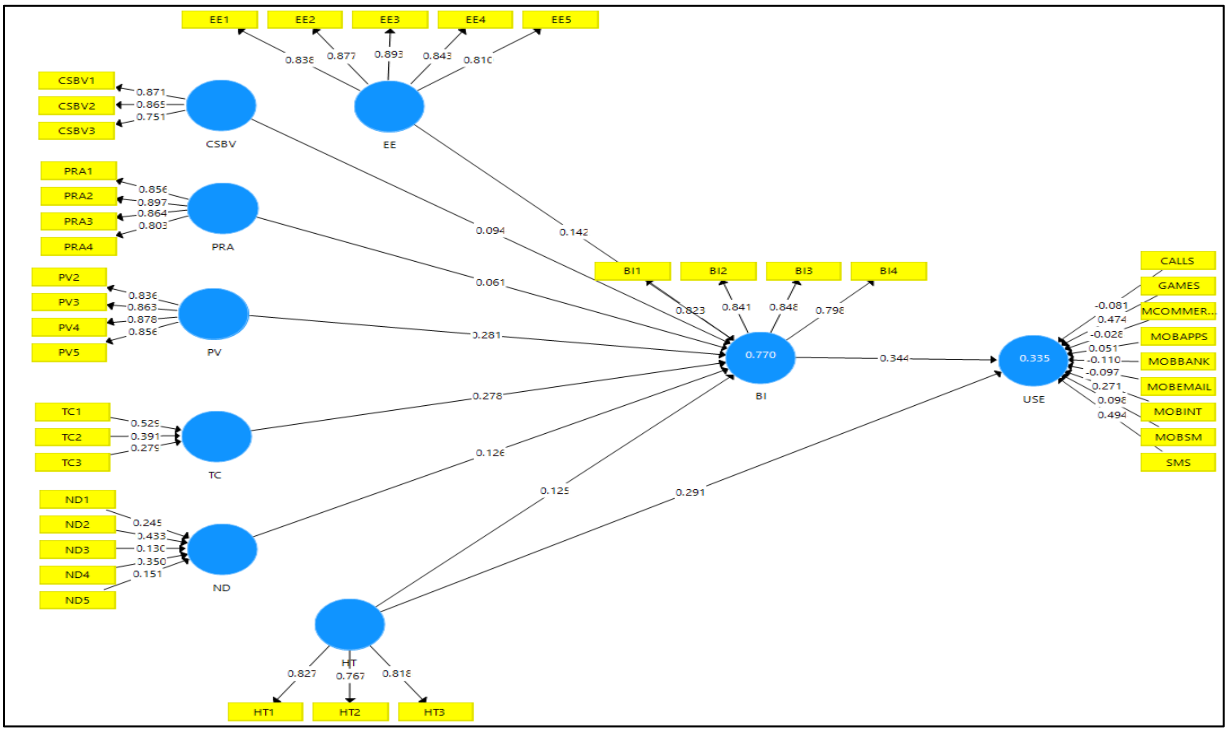
	YES	**NO**
POORICT	31.4%	68.6%
LACKOFREG	37.9%	62.1%
HIGHPRICETAR	33.2%	66.8%
HIGHPRICEMOB	33.9%	66.1%
HIGHPRICEINT	34.4%	65.6%
BADNET	40.5%	59.5%
MONOPOLY	21.9%	78.1%
RESTMOBAPPS	20.4%	79.6%
ETHICISSUES	27.1%	72.9%
CULTUISSUES	25.6%	74.4%
OTHER	0.0%	100.0%

Results of Assessment of Normality of Data Distribution for the Iraqi Sample

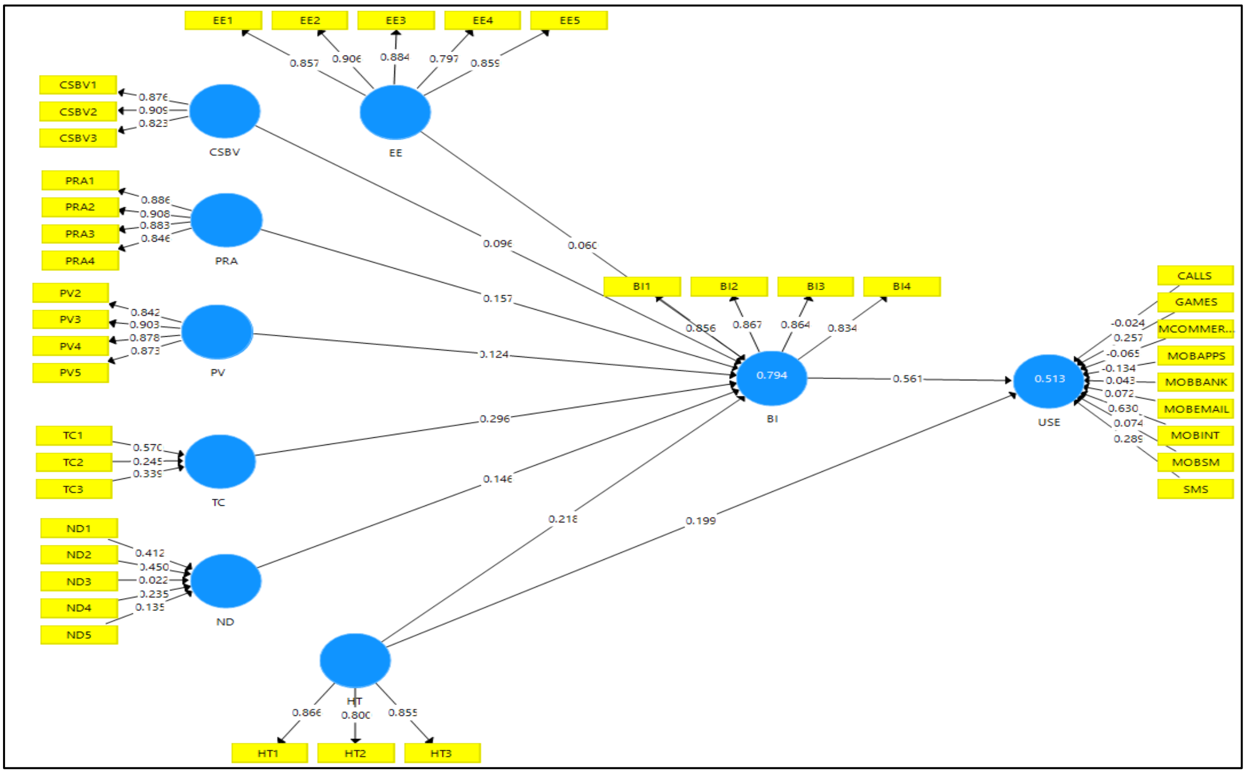
	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
FC1	1.00	7.00	5.0879	1.99364	-.829	.122	-.523	.244
FC2	1.00	7.00	4.9472	1.86029	-.730	.122	-.501	.244
FC3	1.00	7.00	5.4799	1.65648	**-1.166**	.122	.605	.244
FC4	1.00	7.00	5.3291	1.74861	**-1.095**	.122	.329	.244
FC5	1.00	7.00	5.2136	1.82403	-.995	.122	.102	.244
FC6	1.00	7.00	5.2085	1.70913	-.881	.122	.004	.244
Enj1	1.00	7.00	4.8241	1.97955	-.577	.122	-.827	.244
Enj2	1.00	7.00	5.0628	1.78111	-.826	.122	-.177	.244
Enj3	1.00	7.00	4.9196	1.82028	-.593	.122	-.606	.244
SI1	1.00	7.00	5.2487	1.71405	-.876	.122	.008	.244
SI2	1.00	7.00	4.9975	1.68636	-.553	.122	-.567	.244
SI3	1.00	7.00	5.0352	1.74546	-.700	.122	-.413	.244
PRA1	1.00	7.00	5.7387	1.64388	**-1.412**	.122	**1.247**	.244
PRA2	1.00	7.00	5.8819	1.46620	**-1.568**	.122	**2.109**	.244
PRA3	1.00	7.00	5.7462	1.59136	**-1.444**	.122	**1.417**	.244
PRA4	1.00	7.00	5.6508	1.55702	**-1.309**	.122	**1.242**	.244
EE1	1.00	7.00	5.5854	1.62366	**-1.380**	.122	**1.316**	.244
EE2	1.00	7.00	5.5377	1.55093	**-1.158**	.122	.802	.244
EE3	1.00	7.00	5.4925	1.52352	**-1.152**	.122	.926	.244
EE4	1.00	7.00	5.5176	1.60398	**-1.186**	.122	.785	.244
EE5	1.00	7.00	5.5427	1.63923	**-1.190**	.122	.761	.244
CSBV1	1.00	7.00	5.2487	1.81262	-.969	.122	.105	.244
CSBV2	1.00	7.00	5.0628	1.75116	-.665	.122	-.439	.244
CSBV3	1.00	7.00	4.6533	1.96580	-.512	.122	-.870	.244

TC1	1.00	7.00	5.6055	1.61157	**-1.211**	.122	.807	.244
TC2	1.00	7.00	5.3719	1.66983	-.994	.122	.199	.244
TC3	1.00	7.00	5.1884	1.74499	-.800	.122	-.250	.244
ND1	1.00	7.00	5.4648	1.66684	**-1.106**	.122	.495	.244
ND2	1.00	7.00	5.4196	1.59101	-.916	.122	.181	.244
ND3	1.00	7.00	4.9523	1.71678	-.538	.122	-.518	.244
ND4	1.00	7.00	4.9824	1.72175	-.654	.122	-.295	.244
ND5	1.00	7.00	4.9221	1.70241	-.660	.122	-.183	.244
PV1	1.00	7.00	5.0553	1.81983	-.735	.122	-.407	.244
PV2	1.00	7.00	5.3920	1.73194	**-1.007**	.122	.132	.244
PV3	1.00	7.00	5.4196	1.67582	-.965	.122	.131	.244
PV4	1.00	7.00	5.2739	1.71315	-.818	.122	-.237	.244
PV5	1.00	7.00	5.2613	1.71291	-.907	.122	.008	.244
PV6	1.00	7.00	4.7638	1.72096	-.545	.122	-.429	.244
BI1	1.00	7.00	5.8618	1.62273	**-1.652**	.122	**2.037**	.244
BI2	1.00	7.00	5.7337	1.53036	**-1.308**	.122	**1.209**	.244
BI3	1.00	7.00	5.6156	1.53563	**-1.148**	.122	.699	.244
BI4	1.00	7.00	5.5930	1.67216	**-1.298**	.122	.953	.244
HT1	1.00	7.00	5.5980	1.73980	**-1.202**	.122	.469	.244
HT2	1.00	7.00	4.9146	1.86786	-.584	.122	-.689	.244
HT3	1.00	7.00	5.3719	1.78079	-.987	.122	-.012	.244
Valid N (listwise)								

PLS-SEM Model for the Age Moderator Subsample (Younger users) for the Iraqi Sample



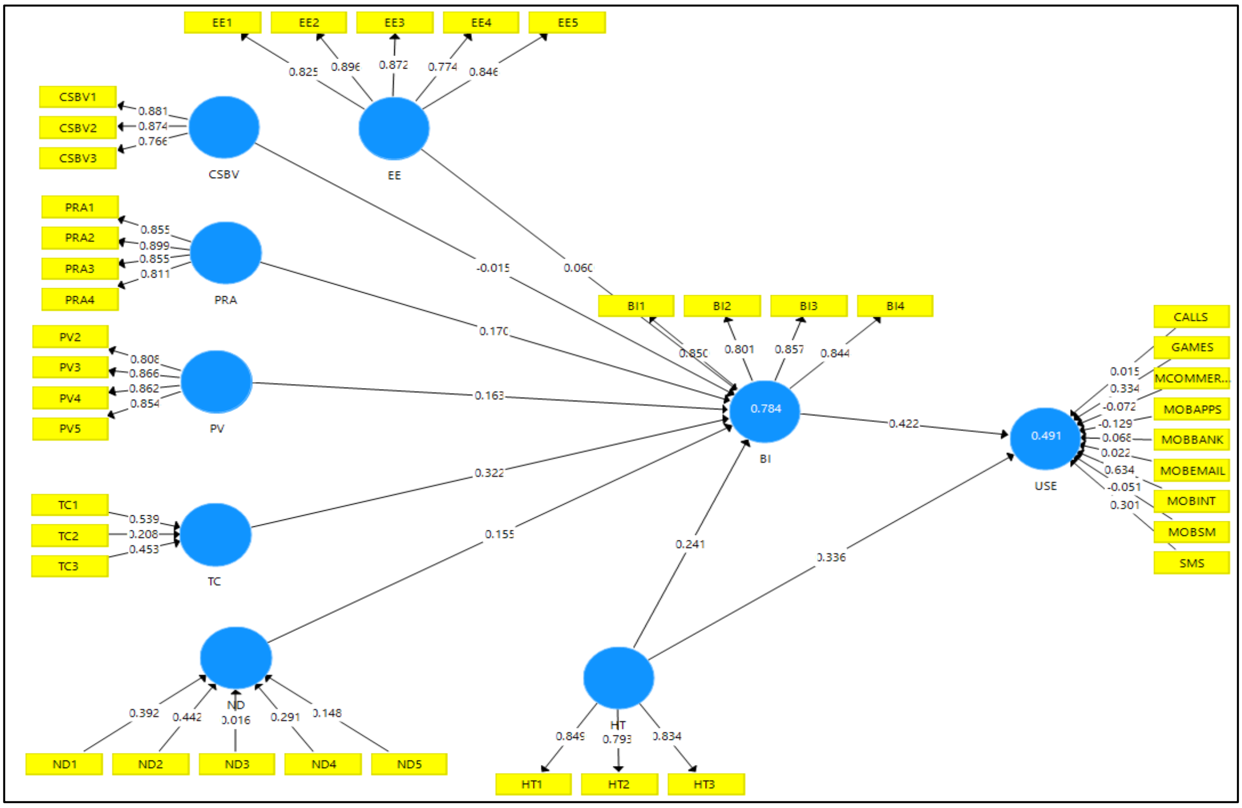
PLS-SEM Model for the Age Moderator Subsample (Older users) for the Iraqi Sample



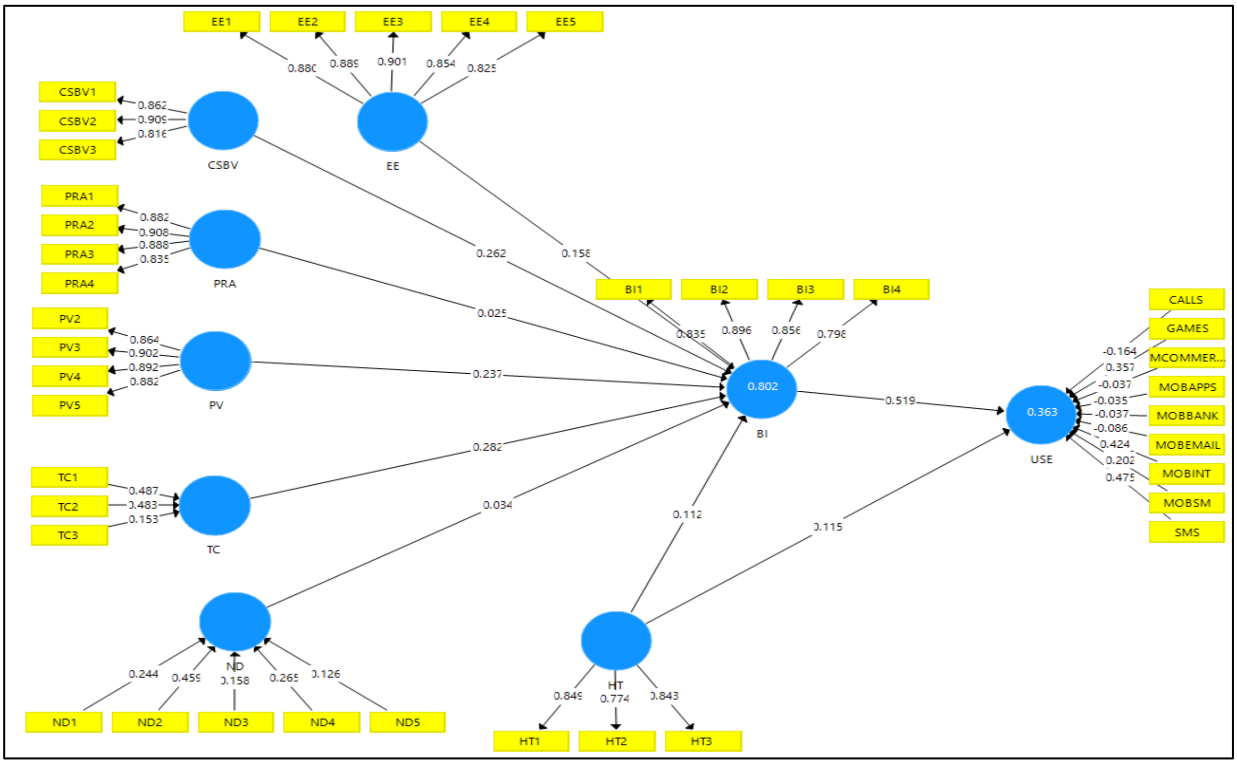
Results of Parametric Test for the Age Moderator’s Effect for the Iraqi Sample

Hypothesis	**Relationship**	**Path Coefficients-diff (Younger group) - (Older Group)**	**t-Value (Younger group) vs (Older Group)**	**p-Value (Younger users) vs Older users)**
H14a	**CSBV -> BI**	0.002	0.021	0.933
H5a	**EE -> BI**	0.082	0.970	0.333
H11a	**HT -> BI**	0.092	1.280	0.201
H12a	**HT -> USE**	0.075	0.489	0.625
H15a	**ND -> BI**	0.020	0.223	0.823
H4a	**PRA -> BI**	0.097	1.043	0.298
H10a	**PV -> BI**	0.157	1.751	0.081
H13a	**TC -> BI**	0.018	0.186	0.853

PLS-SEM Model for the Gender Moderator Subsample (Male users) for the Iraqi Sample



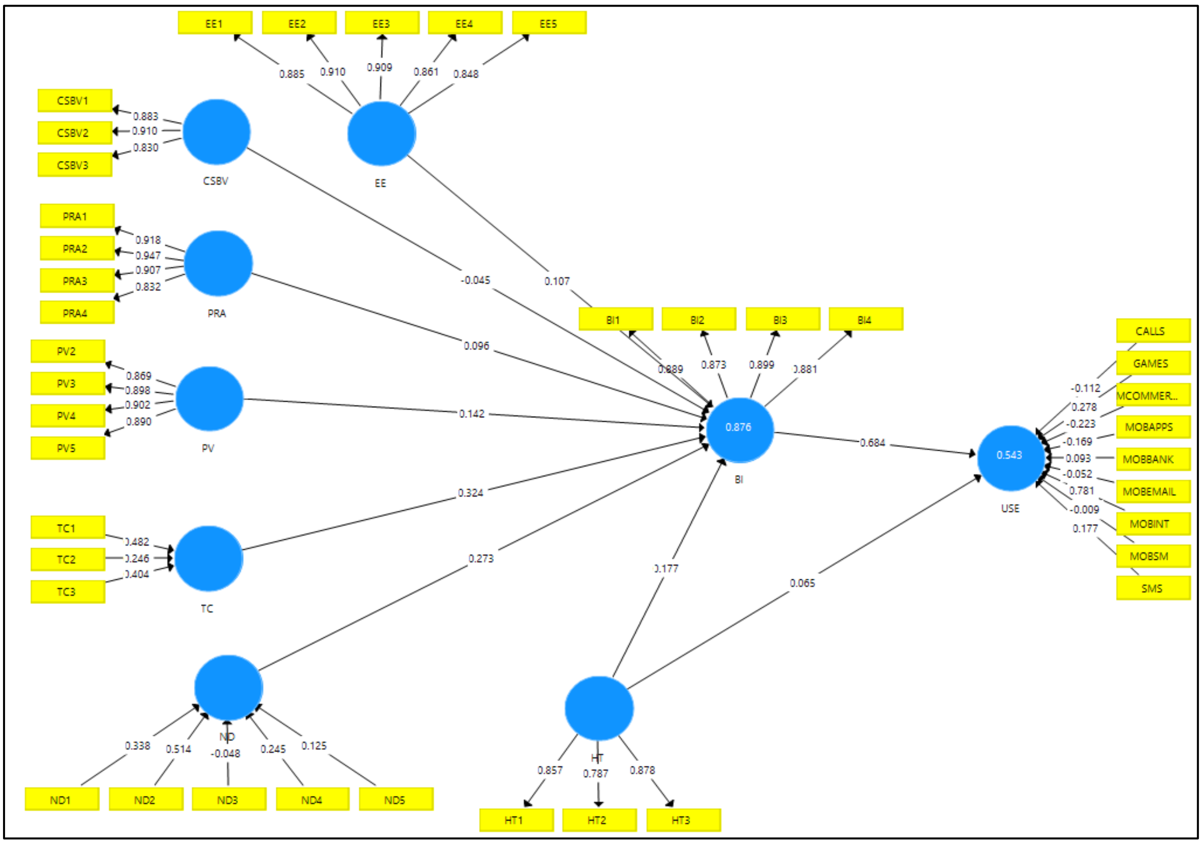
PLS-SEM Model for the Gender Moderator Subsample (Female users) for the Iraqi Sample



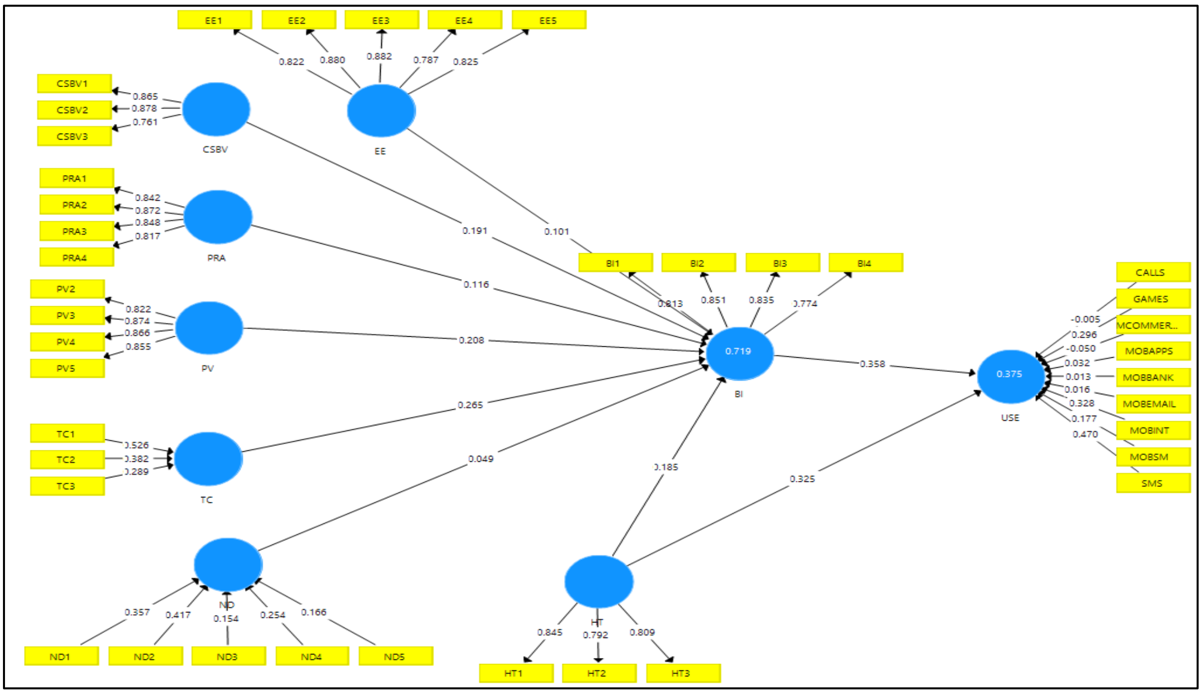
Results of Parametric Test for the Gender Moderator's Effect for the Iraqi Sample

Hypothesis	**Relationship**	**Path Coefficients-diff (Males – Females)**	**t-Value (Males vs Females)**	**p-Value (Males vs Females)**
H14a	**CSBV -> BI**	0.277	3.322	0.001
H5a	**EE -> BI**	0.098	1.283	0.200
H11a	**HT -> BI**	0.128	1.741	0.082
H12a	**HT -> USE**	0.227	1.470	0.142
H15a	**ND -> BI**	0.120	1.323	0.187
H4a	**PRA -> BI**	0.145	1.651	0.100
H10a	**PV -> BI**	0.073	0.840	0.402
H13a	**TC -> BI**	0.041	0.444	0.658

PLS-SEM Model for the Education Moderator Subsample (Low education users) for the Iraqi Sample



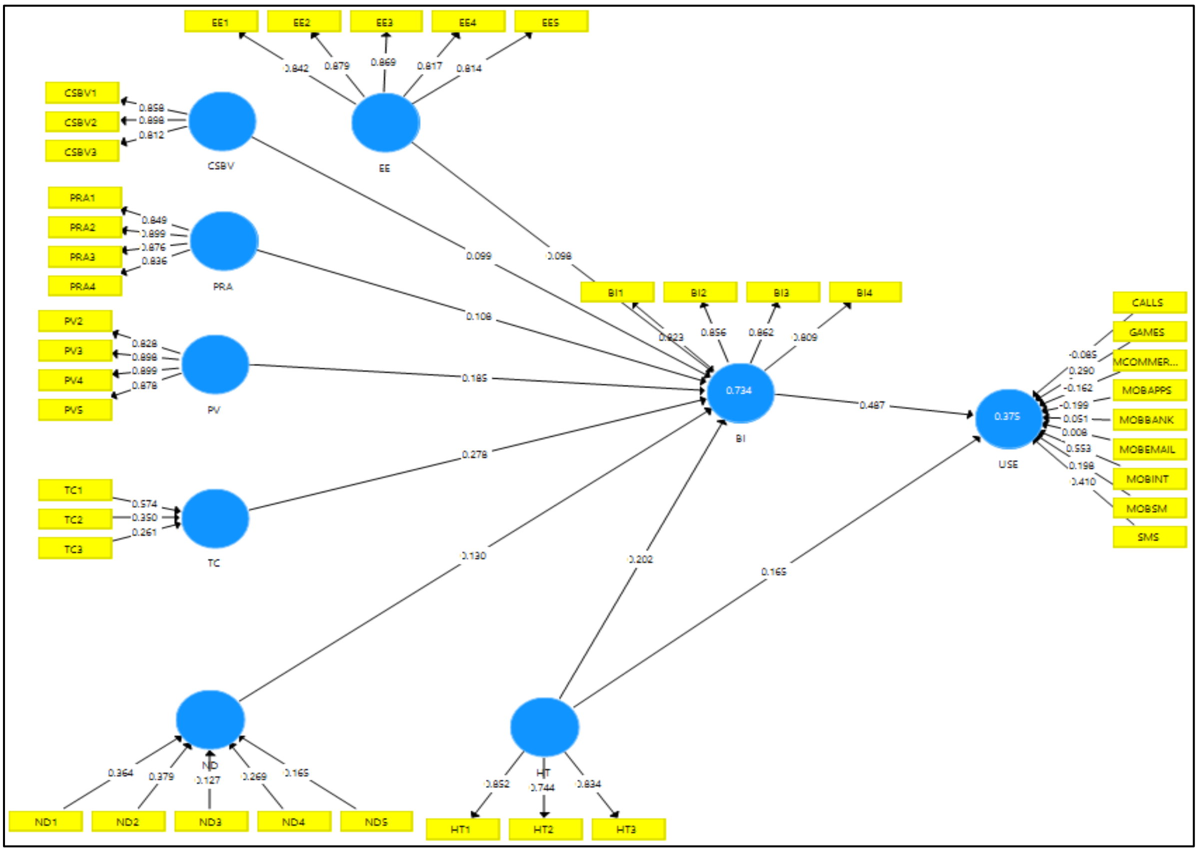
PLS-SEM Model for the Education Moderator Subsample (High education users) for the Iraqi Sample



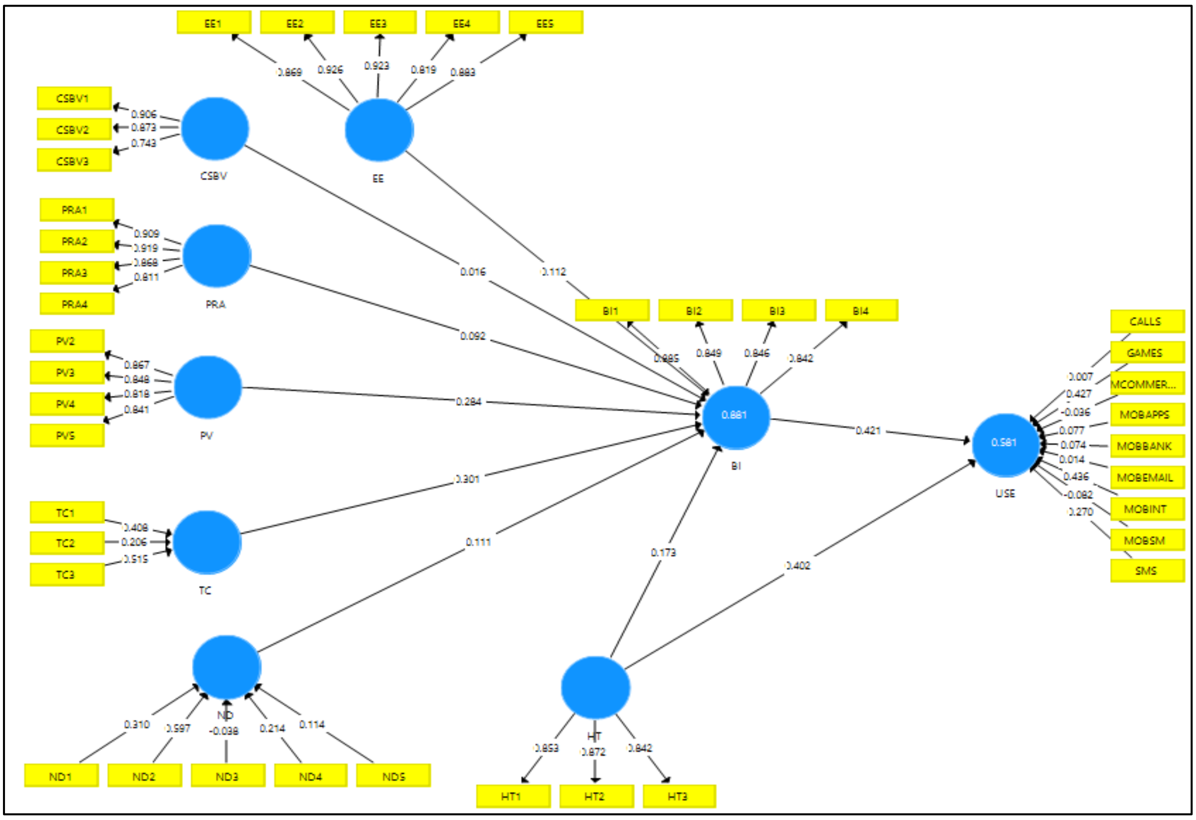
Results of Parametric Test for the Education Moderator’s Effect for the Iraqi Sample

		Path Coefficients-diff (low education – high education)	t-Value (low education vs high education)	p-Value (high education vs high education)
H5a	**EE -> BI**	0.007	0.076	0.939
	CSBV -> BI	0.236	2.409	0.016
	ND -> BI	0.224	2.523	0.012

PLS-SEM Model for the Income Moderator Subsample (Users with low income) for the Iraqi Sample



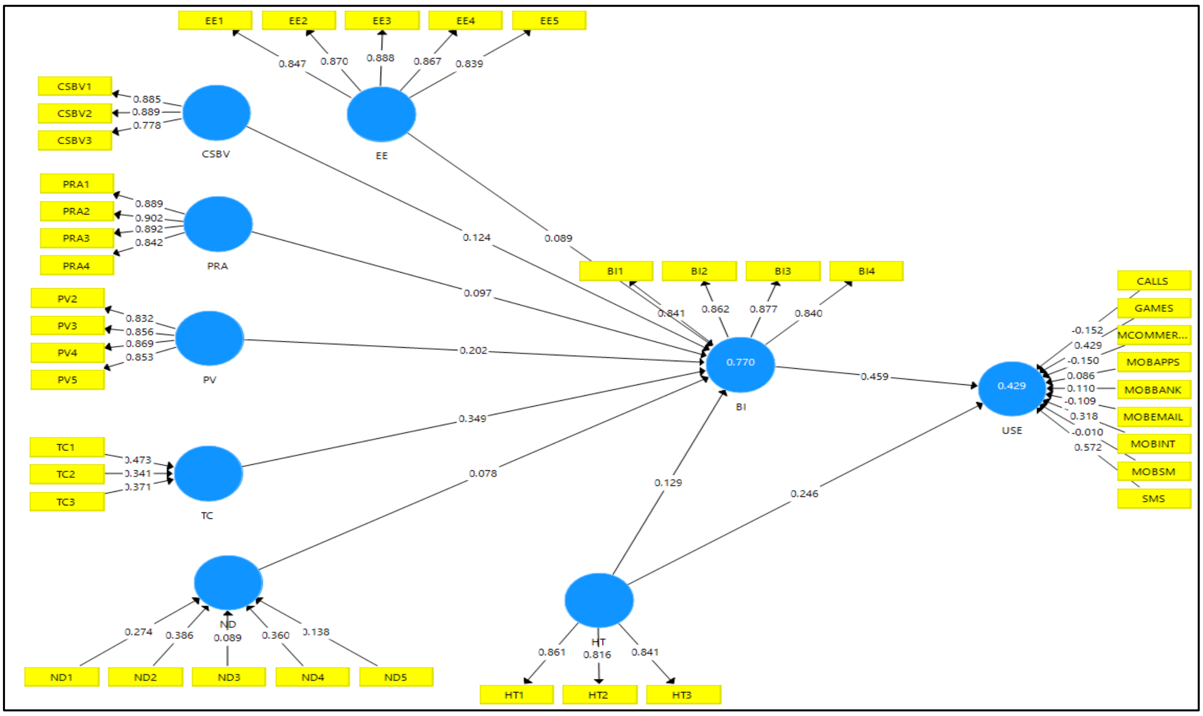
PLS-SEM Model for the Income Moderator Subsample (Users with high income) for the Iraqi Sample



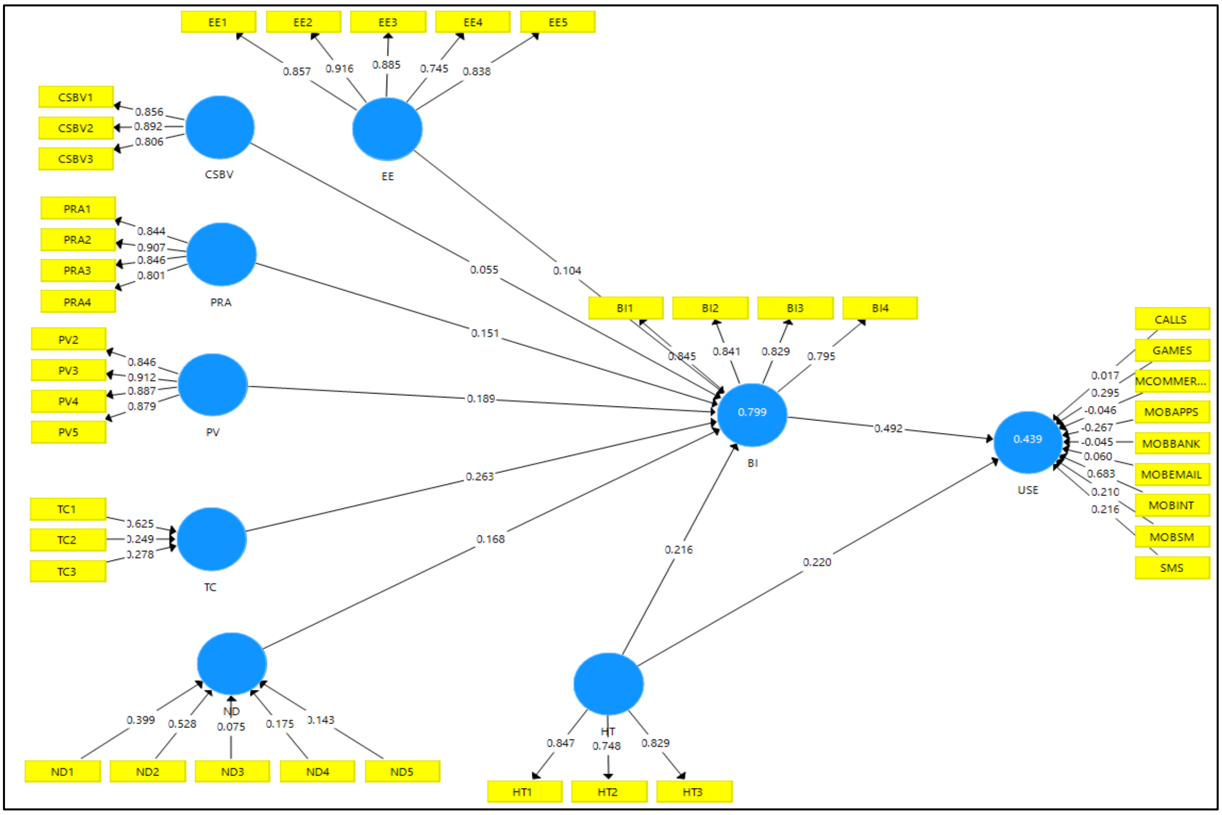
Results of Parametric Test for the Income Moderator Variable for the Iraqi Sample

Hypothesis	Relationship	Path Coefficients-diff (Low Income users - High Income Users)	t-Value (Low Income users vs High Income Users)	p-Value (Low Income users vs High Income Users)
H10a	**PV -> BI**	0.099	0.811	0.418
H13a	**TC -> BI**	0.023	0.209	0.835

PLS-SEM Model for the Experience Moderator Subsample (Users with low experience) for the Iraqi Sample



PLS-SEM Model for the Experience Moderator Subsample (Users with high experience) for the Iraqi Sample



Results of Parametric Test for the Experience Moderator's Effect for the Iraqi Sample

Hypothesis	Relationship	Path Coefficients-diff (Low experience) – (High experience)	t-Value (Low experience vs High experience)	p-Value (Low experience vs High experience)
H3a	**BI -> USE**	0.034	0.220	0.826
H14a	**CSBV -> BI**	0.068	0.795	0.427
H5a	**EE -> BI**	0.014	0.172	0.864
H11a	**HT -> BI**	0.086	1.132	0.258
H12a	**HT -> USE**	0.025	0.170	0.865

Results of Assessment of Mean Differences Between Younger and Older Users in Terms of Usage of Mobile Phones and their Applications Among Iraqi Users

AGE		CAL-LS	SMS	MOB INT	GAM ES	MOBE MAIL	MOB APPS	MOB SM	MOB BANK	M COMM ERCE
18-22	Mean	5.95	5.56	5.48	4.44	4.01	5.16	4.88	1.22	1.15
	N	186	186	186	186	186	186	186	186	186
	Std. Deviation	1.097	1.437	1.796	2.178	2.302	1.913	2.032	0.49	0.4
23-29	Mean	6.21	5.68	5.6	4.87	4.78	5.58	5.25	1.27	1.22
	N	212	212	212	212	212	212	212	212	212
	Std. Deviation	1.038	1.493	1.65	2.046	2.093	1.689	1.998	0.57	0.49
Total	Mean	6.09	5.62	5.55	4.67	4.42	5.38	5.08	1.25	1.19
	N	398	398	398	398	398	398	398	398	398
	Std. Deviation	1.073	1.466	1.719	2.118	2.224	1.807	2.02	0.53	0.45

Results of Assessment of Mean Differences Between High Experience and Low Experience Users in Terms of Usage of Mobile Phones and their Applications Among Iraqi Users

EXP		CALLS	SMS	MOB INT	GAM ES	MOBE MAIL	MOB APP S	MOBS M	MOBB ANK	MCOM MERCE
	Mean	6.02	5.57	5.45	4.54	4.12	5.2	4.97	1.22	1.18
	N	194	194	194	194	194	194	194	194	194
Low Exp	Std. Deviation	1.07	1.53	1.81	2.22	2.3	1.86	2.07	0.49	0.43
	Mean	6.16	5.67	5.64	4.79	4.71	5.55	5.18	1.27	1.19
High Exp	N	204	204	204	204	204	204	204	204	204

	Std. Deviation	1.06	1.4	1.61	2.01	2.1	1.73	1.97	0.56	0.46
Total	Mean	6.09	5.62	5.55	4.67	4.42	5.38	5.08	1.25	1.18
	N	398	398	398	398	398	398	398	398	398
	Std. Deviation	1.07	1.46	1.71	2.11	2.22	1.8	2.02	0.532	0.44

Results of Explanatory Power for the Model in Iraq in Different Groups

	R^2 for BI	**R^2 for USE**
Original Model	0.776	0.413
Younger Users	0.770	0.335
Older Users	0.794	0.513
Males	0.784	0.491
Females	0.802	0.363
Low Education Level Users	0.876	0.543
High Education Level Users	0.719	0.375
Low Income Users	0.734	0.375
High Income Users	**0.881**	**0.581**
Low Experience Users	0.770	0.429
High Experience Users	0.799	0.439

Results of the Assessment of the Structural Model for the Iraqi Sample

	Path Coefficients	**Standard Error**	**T Statistics**	**Significance levels**	**P Values**	***f*2**	**q2**
BI -> USE (H3)	0.401	0.087	4.636	***	0.000	0.099	
PRA -> BI (H4)	0.124	0.049	2.561	*	0.011	0.024	0.009
EE -> BI (H5)	0.127	0.052	2.421	*	0.016	0.024	0.007
SI -> BI (H6)	0.024	0.038	0.627	NS	0.531	0.001	-0.002
FC -> BI (H7)	-0.028	0.037	0.749	NS	0.454	0.002	-0.002
FC -> USE (H8)	-0.010	0.054	0.191	NS	0.848	0.000	
ENJ -> BI (H9)	-0.044	0.033	1.338	NS	0.182	0.005	0.000
PV -> BI (H10)	0.189	0.046	4.085	***	0.000	0.080	0.024
HT -> BI (H11)	0.196	0.038	5.165	***	0.000	0.086	0.030

HT -> USE (H12)	0.220	0.075	2.921	**	0.004	0.041	
TC -> BI (H13)	0.289	0.051	5.703	***	0.000	0.144	0.045
CSBV -> BI (H14)	0.094	0.047	1.989	*	0.047	0.018	0.006
ND -> BI (H15)	0.122	0.046	2.629	**	0.009	0.024	0.006
ND -> USE (H16)	0.094	0.082	1.150	NS	0.251	0.007	

* Significance level $P \leq 0.05$. ** Significance level $P \leq 0.01$. *** Significance level $P \leq 0.001$.
NS = not significant

Results of Hypothesis Testing for the Model in Iraq

Hypotheses	Results
H1: Young Arabs accept and use mobile phones	Supported
H2: The proposed model explains young Arab customers' acceptance of mobile phones.	Supported
H3. Behavioural Intention to use mobile phones has a positive significant direct effect on Actual Usage.	Supported
H3a. Experience moderates the effect of Behavioural Intention on Actual Usage such that this effect is stronger among users with a low level of experience.	Rejected
H4: PRA (usefulness) has a positive significant effect on Behavioural Intention.	Supported
H4a. Age and gender moderate the effect of Perceived Relative Advantage (usefulness) on Behavioural Intention such that this effect is stronger among younger individuals and men.	Partially supported
H5. Effort Expectancy has a positive significant effect on Behavioural Intention.	Supported
H5a. Age, gender, experience and education moderate the effect of Effort Expectancy on Behavioural Intention such that this effect is stronger among older individuals, women, individuals with a low experience level and individuals with a low education level.	Rejected
H6. Social Influence has a positive significant effect on Behavioural Intention.	Rejected
H6a. Age, gender and experience moderate the effect of Social Influence on Behavioural Intention such that this effect is stronger	Rejected

among older individuals, women and individuals with a low level of experience.	
H7. Facilitating Conditions have a positive significant effect on Behavioural Intention.	Rejected
H7a. Age, gender and experience moderate the effect of Facilitating Conditions on Behavioural Intention such that this effect is stronger among older individuals, women and individuals with a low level of experience.	Rejected
H8. Facilitating Conditions have a positive significant direct effect on Actual Usage.	Rejected
H8a. Age, gender and experience moderate the effect of Facilitating Conditions on Actual Usage such that this effect is stronger among older individuals, women and individuals with a low level of experience.	Rejected
H9. Enjoyment has a positive significant effect on Behavioural Intention.	Rejected
H9a. Age, gender, experience and income moderate the effect of Enjoyment on Behavioural Intention such that this effect is stronger among younger individuals, men, individuals with a low level of experience and individuals with a high income level.	Rejected
H10. Price Value has a positive significant effect on Behavioural Intention.	Supported
H10a. Age, gender and income moderate the effect of Price Value on Behavioural Intention such that this effect is stronger among older individuals, women and individuals with low income level.	Partially supported
H11. Habit has a positive significant effect on Behavioural Intention	Supported
H11a. Age, gender and experience moderate the effect of Habit on Behavioural Intention such that this effect is stronger among older indviduals, men and individuals with a high level of experience.	Partially supported
H12. Habit has a positive significant direct effect on Actual Usage	Supported
H12a. Age, gender and experience moderate the effect of Habit on Actual Usage such that this effect is stronger among older individuals, men and individuals with a high level of experience.	Rejected

H13. Technological Culturation has a positive significant effect on Behavioural Intention.	Supported
H13a. Age, gender and income moderate the effect of Technological Culturation on Behavioural Intention such that this effect is stronger among younger individuals, men and individuals with a high income level.	Rejected
H14. Culture-Specific Beliefs and Values have a positive significant effect on Behavioural Intention.	Supported
H14a. Age, gender and experience moderate the effect of Culture-Specific Beliefs and Values on Behavioural Intention such that preference for mobile mediated meetings is stronger among younger individuals, women and individuals with a high level of experience.	Partially supported
H15. National IT Development has a positive significant effect on Behavioural Intention.	Supported
H15a. Age and gender moderate the effect of National IT Development on Behavioural Intention such that this effect is stronger among younger individuals and men.	Rejected
H16: National IT Development has a positive significant direct effect on Actual Use.	Rejected
H16a. Age and gender moderate the effect of National IT Development on Actual Usage such that this effect is stronger among younger indivduals and men.	Rejected

Appendix-R: Results of the Analysis of the Data from Jordan

Results of Assessment of Mann-Whitney-U-Test for Testing Non-response bias for the Jordanian Sample

	FC	Enj	SI	PRA	EE	CSBV
Mann-Whitney U	1888.000	2019.000	1984.500	1967.000	1992.500	2200.000
Wilcoxon W	4516.000	4647.000	4612.500	4595.000	4620.500	4828.000
Z	-1.540	-.992	-1.122	-1.227	-1.089	-.147

Asymp. Sig. (2-tailed)	.123	.321	.262	.220	.276	.883

	TC	ND	PV	BI	HT	USE
Mann-Whitney U	1992.000	1822.500	2015.000	2212.500	1898.500	1914.000
Wilcoxon W	3945.000	4450.500	3968.000	4840.500	4526.500	3867.000
Z	-1.087	-1.837	-.970	-.098	-1.551	-1.424
Asymp. Sig. (2-tailed)	.277	.066	.332	.922	.121	.154

a. Grouping Variable: Respondent (1=early, 2=late)

Descriptive statistics for Jordan

The Country the respondents were born in

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Jordan	429	100.0	100.0	100.0

The Number of Years the Respondents spent in Jordan

Number of years	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 1.00	1	.2	.2	.2

2.00	4	.9	.9	1.2
3.00	8	1.9	1.9	3.0
4.00	5	1.2	1.2	4.2
5.00	9	2.1	2.1	6.3
6.00	2	.5	.5	6.8
7.00	4	.9	.9	7.7
8.00	3	.7	.7	8.4
9.00	4	.9	.9	9.3
10.00	11	2.6	2.6	11.9
11.00	4	.9	.9	12.8
12.00	7	1.6	1.6	14.5
13.00	3	.7	.7	15.2
14.00	2	.5	.5	15.6
15.00	6	1.4	1.4	17.0
16.00	1	.2	.2	17.2
17.00	3	.7	.7	17.9
18.00	24	5.6	5.6	23.5
19.00	38	8.9	8.9	32.4
20.00	52	12.1	12.1	44.5
21.00	32	7.5	7.5	52.0
22.00	23	5.4	5.4	57.3
23.00	22	5.1	5.1	62.5
24.00	24	5.6	5.6	68.1
25.00	38	8.9	8.9	76.9

	26.00	31	7.2	7.2	84.1
	27.00	29	6.8	6.8	90.9
	28.00	20	4.7	4.7	95.6
	29.00	19	4.4	4.4	100.0
	Total	429	100.0	100.0	

Age of Respondents in Jordan

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18-22	167	38.9	38.9	38.9
	23-29	262	61.1	61.1	100.0
	Total	429	100.0	100.0	

Gender of Respondents in Jordan

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	201	46.9	46.9	46.9
	Female	228	53.1	53.1	100.0
	Total	429	100.0	100.0	

Results of Education Level of Respondents in Jordan

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	High School	38	8.9	8.9	8.9

	Diploma	101	23.5	23.5	32.4
	Bachelor Degree	250	58.3	58.3	90.7
	Master Degree	40	9.3	9.3	100.0
	Total	429	100.0	100.0	

Results of Employment Status of Respondents in Jordan

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Employed	184	42.9	42.9	42.9
	Self-employed	42	9.8	9.8	52.7
	Unemployed and currently looking for work	45	10.5	10.5	63.2
	Unemployed and not looking for work	13	3.0	3.0	66.2
	Student	145	33.8	33.8	100.0
	Total	429	100.0	100.0	

Results of Income Level of Respondents in Jordan

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than $10,000	311	72.5	72.5	72.5
	$10,000 to $19,000	74	17.2	17.2	89.7
	$20,000 to $29,000	27	6.3	6.3	96.0
	$30,000 to $39,000	9	2.1	2.1	98.1
	$40,000 to $49,000	3	.7	.7	98.8
	$50,000 or more	5	1.2	1.2	100.0

	Total	429	100.0	100.0	

Results of Assessment of Arabic Language Reading Fluency in the Jordanian Sample

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	429	100.0	100.0	100.0

Results of Assessment of Arabic Language Writing Fluency in the Jordanian Sample

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	429	100.0	100.0	100.0

Results of Assessment of Arabic Language Speaking Fluency in the Jordanian Sample

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	429	100.0	100.0	100.0

Results of Assessment of English Language Reading Fluency in the Jordanian Sample

		Frequency	Percent	Valid Percent	Cumulative Percent
	Yes	323	75.3	75.3	75.3
Valid	No	106	24.7	24.7	100.0
	Total	429	100.0	100.0	

Results of Assessment of English Language Writing Fluency in the Jordanian Sample

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	261	60.8	60.8	60.8
	No	168	39.2	39.2	100.0
	Total	429	100.0	100.0	

Results of Assessment of English Language Speaking Fluency in the Jordanian Sample

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	243	56.6	56.6	56.6
	No	186	43.4	43.4	100.0
	Total	429	100.0	100.0	

Results of Asessment of Mobile Phone Use for the Jordanian Sample

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	429	100.0	100.0	100.0

Results of Asessment of Experience in Using Mobile Phone for the Jordanian Sample

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than 3 years	26	6.1	6.1	6.1
	Less than 5 years	61	14.2	14.2	20.3
	Less than 7 years	131	30.5	30.5	50.8

	Less than 10 years	88	20.5	20.5	71.3
	More than 10 years	123	28.7	28.7	100.0
	Total	429	100.0	100.0	

Summary for Types of Mobile Phones Used by Respondents in Jordan

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		7	1.6	1.6	1.6
	HTC	22	5.1	5.1	6.8
	HUAWEI	74	17.2	17.2	24.0
	iPHONE	100	23.3	23.3	47.3
	LG	10	2.3	2.3	49.7
	NOKIA	22	5.1	5.1	54.8
	NOTE3	4	.9	.9	55.7
	SAMSUNG	170	39.6	39.6	95.3
	SONY	20	4.7	4.7	100.0
	Total	429	100.0	100.0	

Summary for Use of Mobile Applications by Respondents in Jordan

	Minimum	Maximum	Mean	Std. Deviation	Variance
CALLS	1.0	7.0	6.47	.903	0.815
SMS	1.0	7.0	5.37	1.684	2.836
MOBINT	1.0	7.0	6.00	1.424	2.028
GAMES	1.0	7.0	5.25	1.862	3.467

MOBEMAIL	1.0	7.0	5.50	1.677	2.811
MOBAPPS	1.0	7.0	6.18	1.288	1.660
MOBSM	1.0	7.0	5.98	1.562	2.439
MOBBANK	1.0	7.0	2.04	1.432	2.050
MCOMMERCE	1.0	7.0	1.82	1.281	1.640

Results of Descriptive Statistics for Likert Scale Items for the Jordanian Sample

	Minimum	Maximum	Mean	Std. Deviation	Variance
FC1	1.00	7.00	5.31	1.68	2.81
FC2	1.00	7.00	5.40	1.55	2.41
FC4	1.00	7.00	5.67	1.45	2.10
FC3	1.00	7.00	5.65	1.39	1.93
FC5	1.00	7.00	5.41	1.49	2.21
FC6	1.00	7.00	5.32	1.55	2.40
Enj1	1.00	7.00	5.47	1.69	2.87
Enj2	1.00	7.00	5.54	1.53	2.33
Enj3	1.00	7.00	5.51	1.61	2.60
SI1	1.00	7.00	5.09	1.63	2.67
SI2	1.00	7.00	4.93	1.60	2.57
SI3	1.00	7.00	4.93	1.55	2.40
PRA1	1.00	7.00	5.85	1.50	2.24
PRA2	1.00	7.00	5.86	1.40	1.95
PRA3	1.00	7.00	5.81	1.47	2.15
PRA4	1.00	7.00	5.82	1.43	2.04
EE1	1.00	7.00	5.78	1.44	2.08
EE2	1.00	7.00	5.77	1.35	1.82
EE3	1.00	7.00	5.76	1.33	1.78
EE4	1.00	7.00	5.73	1.45	2.11
EE5	1.00	7.00	5.83	1.39	1.93
CSBV1	1.00	7.00	5.60	1.65	2.74
CSBV2	1.00	7.00	5.53	1.54	2.36
CSBV3	1.00	7.00	5.38	1.66	2.75
TC1	1.00	7.00	5.43	1.60	2.56

TC2	1.00	7.00	5.37	1.53	2.34
TC3	1.00	7.00	5.20	1.66	2.75
ND1	1.00	7.00	5.77	1.51	2.27
ND2	1.00	7.00	5.77	1.43	2.04
ND3	1.00	7.00	5.41	1.56	2.43
ND4	1.00	7.00	5.10	1.58	2.50
ND5	1.00	7.00	4.86	1.61	2.60
PV1	1.00	7.00	5.52	1.67	2.79
PV2	1.00	7.00	5.48	1.62	2.63
PV3	1.00	7.00	5.57	1.52	2.32
PV4	1.00	7.00	5.35	1.53	2.33
PV5	1.00	7.00	5.01	1.65	2.73
PV6	1.00	7.00	4.96	1.56	2.43
BI1	1.00	7.00	5.87	1.51	2.27
BI2	1.00	7.00	5.81	1.48	2.20
BI3	1.00	7.00	5.79	1.49	2.21
BI4	1.00	7.00	5.82	1.51	2.27
HT1	1.00	7.00	5.62	1.61	2.60
HT2	1.00	7.00	5.23	1.76	3.09
HT3	1.00	7.00	5.53	1.66	2.74

Summary of Descriptive Statistics on Jordanian Respondents' Agreement Whether Challenges Facing Mobile Phone Adoption and Use Exist

MOBCHALL

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	163	38.0	38.0	38.0

	No	266	62.0	62.0	100.0
	Total	429	100.0	100.0	

Summary of Challenges Facing Mobile Phone Adoption and Use in Jordan

	YES	**NO**
POORICT	17.5%	82.5%
LACKOFREG	15.2%	84.8%
HIGHPRICETAR	20.0%	80.0%
HIGHPRICEMOB	25.2%	74.8%
HIGHPRICEINT	22.6%	77.4%
BADNET	26.1%	73.9%
MONOPOLY	12.4%	87.6%
RESTMOBAPPS	11.0%	89.0%
ETHICISSUES	18.4%	81.6%
CULTUISSUES	14.9%	85.1%
OTHER	0%	100%

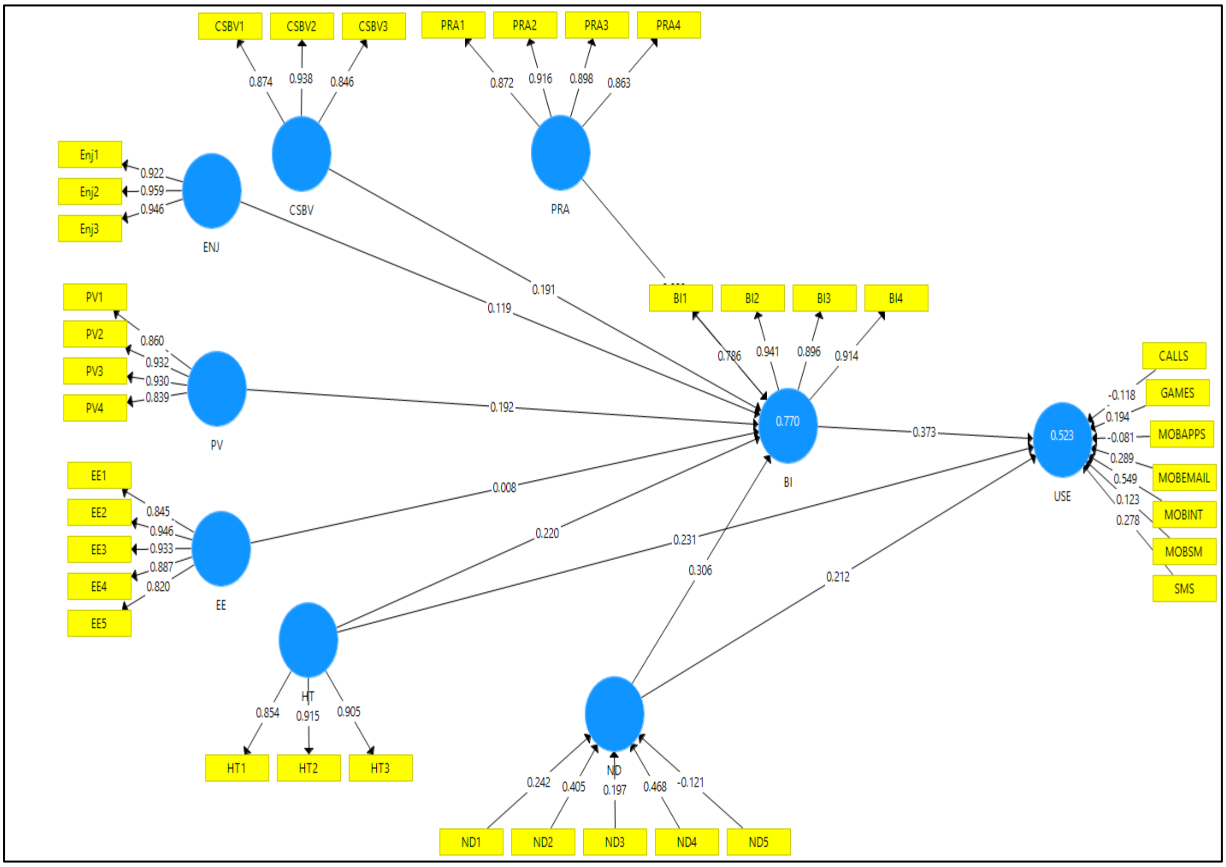
Results of Assessment of Normality of Data Distribution for the Jordanian Sample

	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
FC1	1.00	7.00	5.3124	1.67733	-.985	.118	.330	.235
FC2	1.00	7.00	5.4033	1.55223	**-1.046**	.118	.608	.235
FC3	1.00	7.00	5.6480	1.38909	**-1.302**	.118	**1.913**	.235
FC4	1.00	7.00	5.6690	1.44930	**-1.200**	.118	**1.055**	.235
FC5	1.00	7.00	5.4126	1.48825	**-1.086**	.118	.909	.235
FC6	1.00	7.00	5.3193	1.54923	-.994	.118	.538	.235
Enj1	1.00	7.00	5.4685	1.69305	**-1.147**	.118	.544	.235
Enj2	1.00	7.00	5.5431	1.52736	**-1.197**	.118	**1.082**	.235
Enj3	1.00	7.00	5.5082	1.61131	**-1.173**	.118	.855	.235

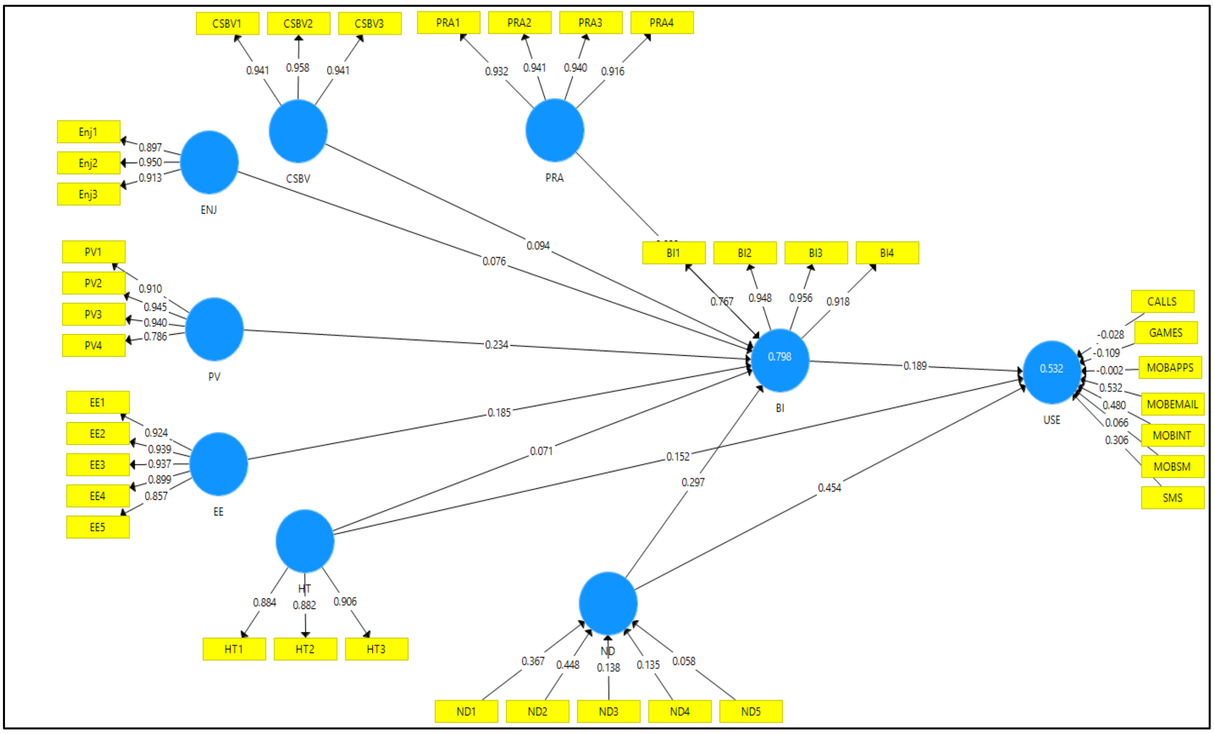
SI1	1.00	7.00	5.0909	1.63451	-.953	.118	.304	.235
SI2	1.00	7.00	4.9301	1.60454	-.885	.118	.256	.235
SI3	1.00	7.00	4.9254	1.54800	-.695	.118	-.063	.235
PRA1	1.00	7.00	5.8508	1.49645	**-1.651**	.118	**2.347**	.235
PRA2	1.00	7.00	5.8648	1.39773	**-1.661**	.118	**2.750**	.235
PRA3	1.00	7.00	5.8089	1.46639	**-1.457**	.118	**1.698**	.235
PRA4	1.00	7.00	5.8228	1.42781	**-1.524**	.118	**2.141**	.235
EE1	1.00	7.00	5.7762	1.44082	**-1.576**	.118	**2.195**	.235
EE2	1.00	7.00	5.7692	1.35011	**-1.491**	.118	**2.223**	.235
EE3	1.00	7.00	5.7552	1.33369	**-1.450**	.118	**2.192**	.235
EE4	1.00	7.00	5.7296	1.45383	**-1.502**	.118	**2.042**	.235
EE5	1.00	7.00	5.8275	1.39025	**-1.560**	.118	**2.322**	.235
CSBV1	1.00	7.00	5.5967	1.65425	**-1.369**	.118	**1.111**	.235
CSBV2	1.00	7.00	5.5315	1.53527	**-1.182**	.118	.893	.235
CSBV3	1.00	7.00	5.3823	1.65712	**-1.044**	.118	.344	.235
TC1	1.00	7.00	5.4312	1.59967	**-1.201**	.118	.938	.235
TC2	1.00	7.00	5.3683	1.52840	**-1.055**	.118	.650	.235
TC3	1.00	7.00	5.1958	1.65870	-.907	.118	.126	.235
ND1	1.00	7.00	5.7739	1.50627	**-1.519**	.118	**1.962**	.235
ND2	1.00	7.00	5.7692	1.42913	**-1.345**	.118	**1.496**	.235
ND3	1.00	7.00	5.4103	1.56016	**-1.017**	.118	.493	.235
ND4	1.00	7.00	5.0956	1.58194	-.741	.118	-.104	.235
ND5	1.00	7.00	4.8625	1.61251	-.595	.118	-.312	.235
PV1	1.00	7.00	5.5221	1.67097	**-1.135**	.118	.434	.235
PV2	1.00	7.00	5.4779	1.62274	**-1.018**	.118	.230	.235
PV3	1.00	7.00	5.5711	1.52171	**-1.089**	.118	.601	.235
PV4	1.00	7.00	5.3520	1.52690	-.873	.118	.293	.235
PV5	1.00	7.00	5.0093	1.65335	-.772	.118	-.087	.235

PV6	1.00	7.00	4.9557	1.56043	-.668	.118	-.115	.235
BI1	1.00	7.00	5.8671	1.50810	**-1.608**	.118	**2.146**	.235
BI2	1.00	7.00	5.8112	1.48175	**-1.465**	.118	**1.692**	.235
BI3	1.00	7.00	5.7925	1.48712	**-1.448**	.118	**1.686**	.235
BI4	1.00	7.00	5.8228	1.50741	**-1.534**	.118	**1.955**	.235
HT1	1.00	7.00	5.6200	1.61120	**-1.280**	.118	**1.029**	.235
HT2	1.00	7.00	5.2308	1.75893	-.911	.118	-.144	.235
HT3	1.00	7.00	5.5268	1.65545	**-1.135**	.118	.490	.235

PLS-SEM Model for the Age Moderator Subsample (Younger users) for the Jordanian Sample



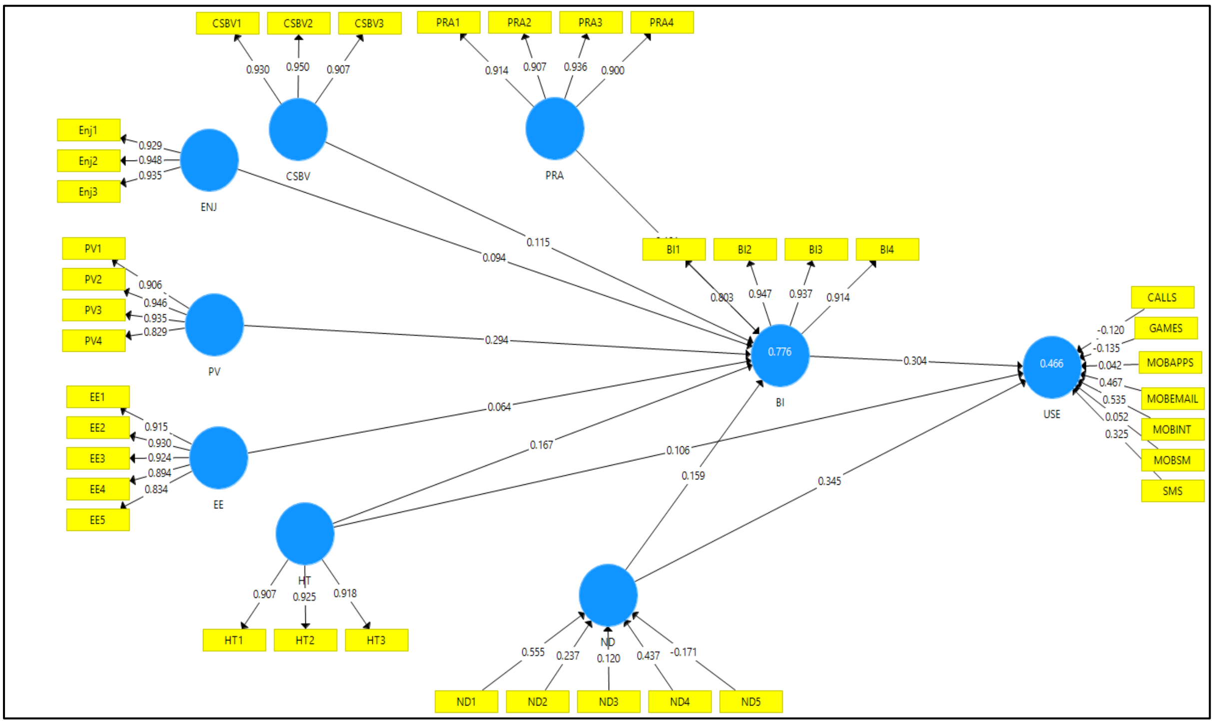
PLS-SEM Model for the Age Moderator Subsample (Older users) for the Jordanian Sample



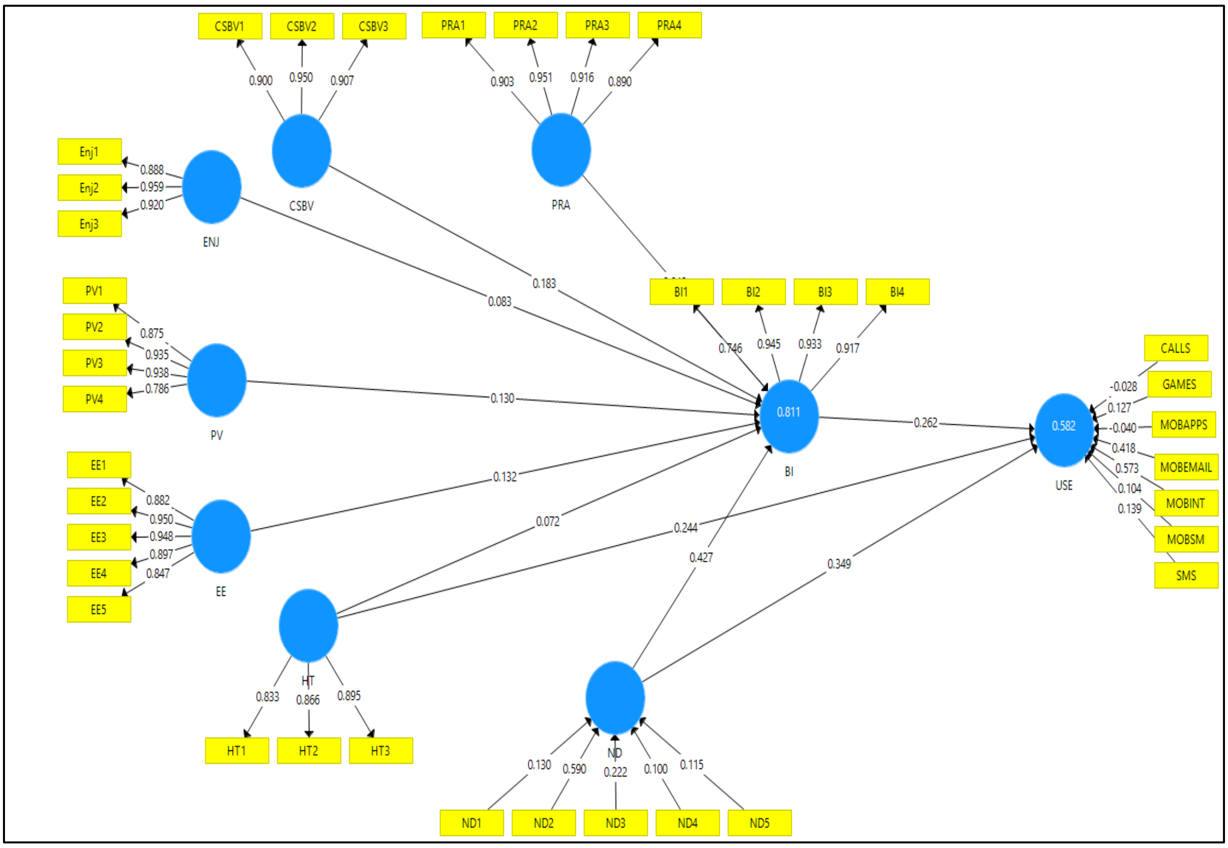
Results of Parametric Test for the Age Moderator's Effect for the Jordanian Sample

Hypothesis	**Relationship**	**Path Coefficients-diff (Younger group) - (Older Group)**	**t-Value (Younger group) vs (Older Group)**	**p-Value (Younger users) vs (Older users)**
H14a	**CSBV -> BI**	0.096	0.843	0.400
H5a	**EE -> BI**	0.177	1.839	0.067
H9a	**Enj -> BI**	0.043	0.658	0.511
H11a	**HT -> BI**	0.149	1.885	0.060
H12a	**HT -> USE**	0.079	0.533	0.594
H15a	**ND -> BI**	0.009	0.081	0.936
H16a	**ND -> USE**	0.243	1.202	0.230
H4a	**PRA -> BI**	0.001	0.008	0.994
H10a	**PV -> BI**	0.042	0.349	0.727

PLS-SEM Model for the Gender Moderator Subsample (Male users) for the Jordanian Sample



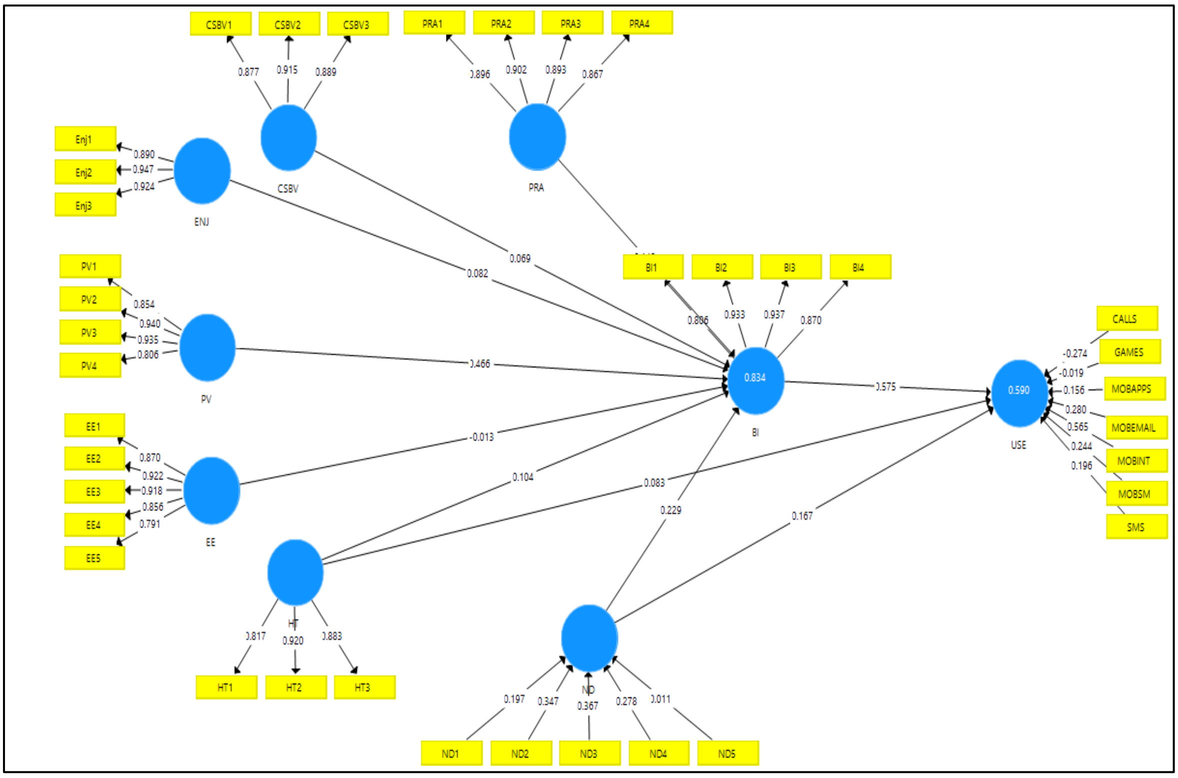
PLS-SEM Model for the Gender Moderator Subsample (Female users) for the Jordanian Sample



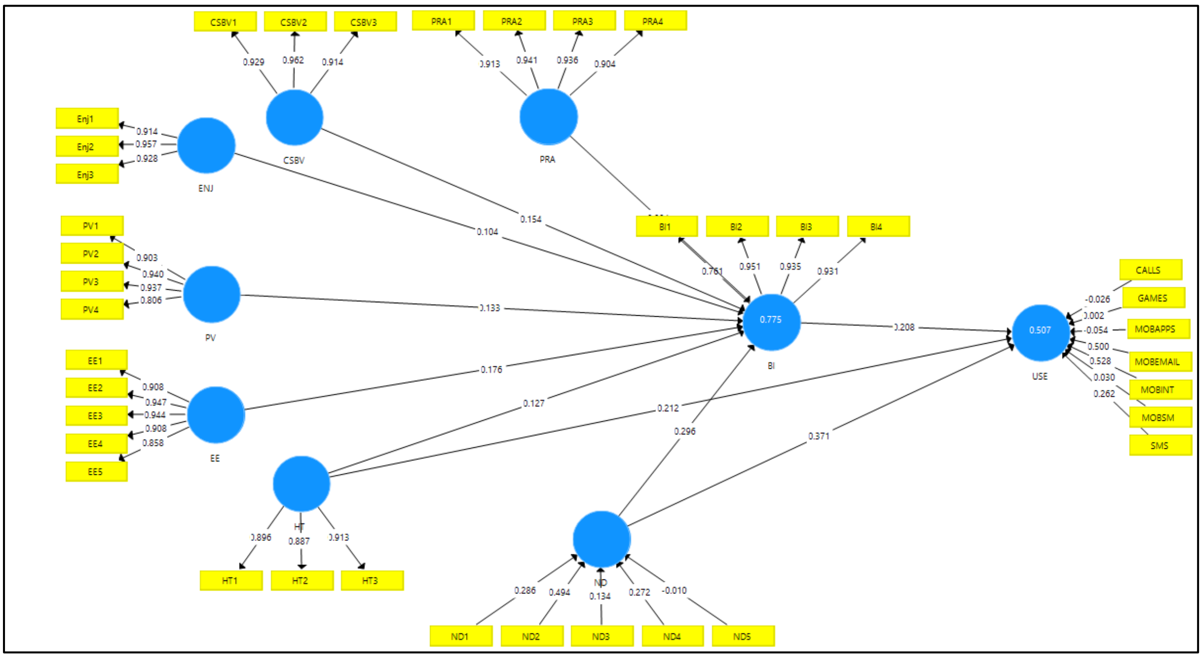
Results of Parametric Test for the Gender Moderator's Effect for the Jordanian Sample

Hypothesis	Relationship	Path Coefficients-diff (Males – Females)	t-Value (Males vs Females)	p-Value (Males vs Females)
H14a	**CSBV -> BI**	0.068	0.583	0.560
H5a	**EE -> BI**	0.067	0.704	0.482
H9a	**Enj -> BI**	0.011	0.155	0.877
H11a	**HT -> BI**	0.095	1.162	0.246
H12a	**HT -> USE**	0.138	1.028	0.304
H15a	**ND -> BI**	0.268	2.412	0.016
H16a	**ND -> USE**	0.004	0.022	0.982
H4a	**PRA -> BI**	0.142	1.740	0.083
H10a	**PV -> BI**	0.164	1.580	0.115

PLS-SEM Model for the Education Moderator Subsample (Low education users) for the Jordanian Sample



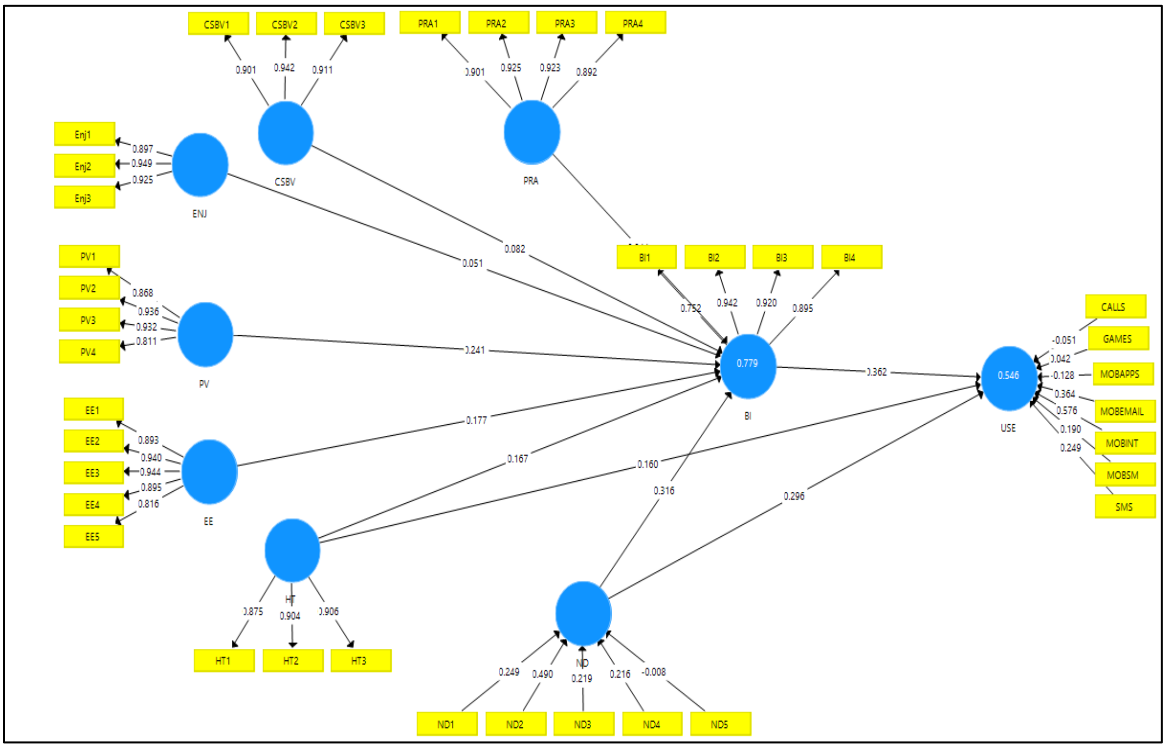
PLS-SEM Model for the Education Moderator Subsample (High education users) for the Jordanian Sample



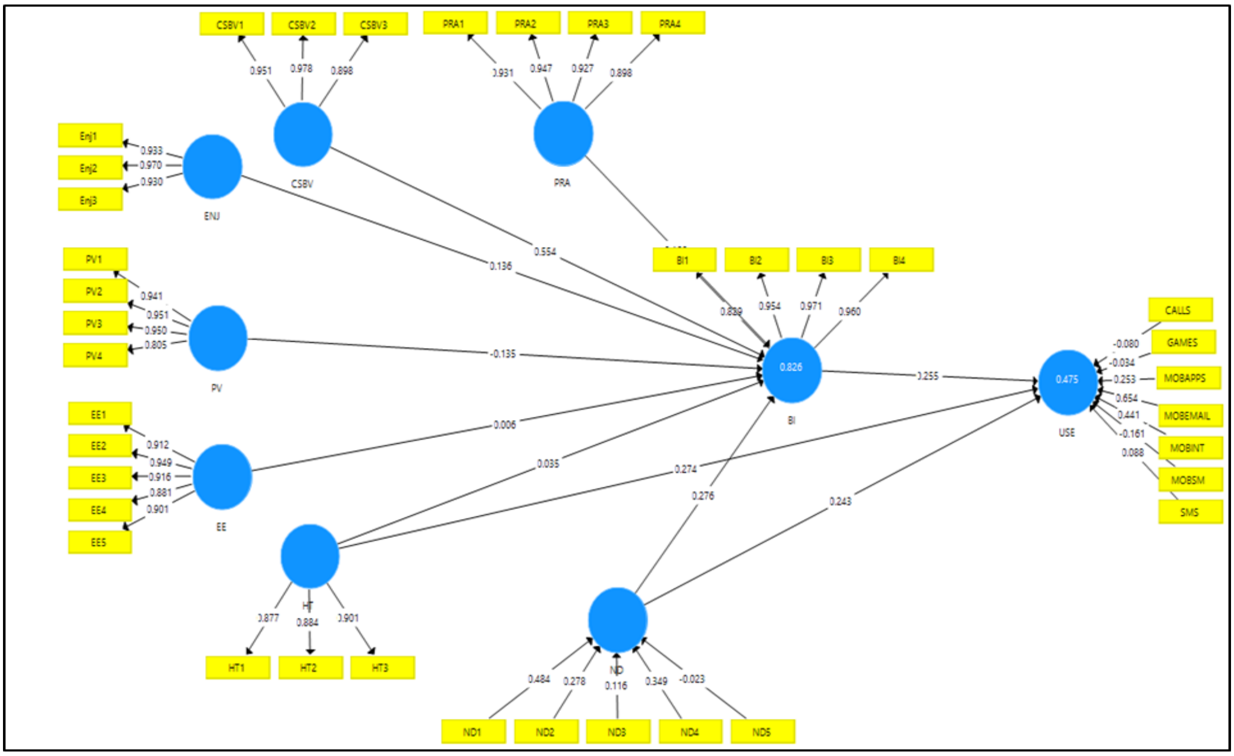
Results of Parametric Test for the Education Moderator’s Effect for the Jordanian Sample

		Path Coefficients-diff (low education – high education)	**t-Value (low education vs high education)**	**p-Value (high education vs high education)**
H5a	**EE -> BI**	0.189	1.912	0.057
	PV -> BI	0.333	2.935	0.004

PLS-SEM Model for the Income Moderator Subsample (Users with low income) for the Jordanian Sample



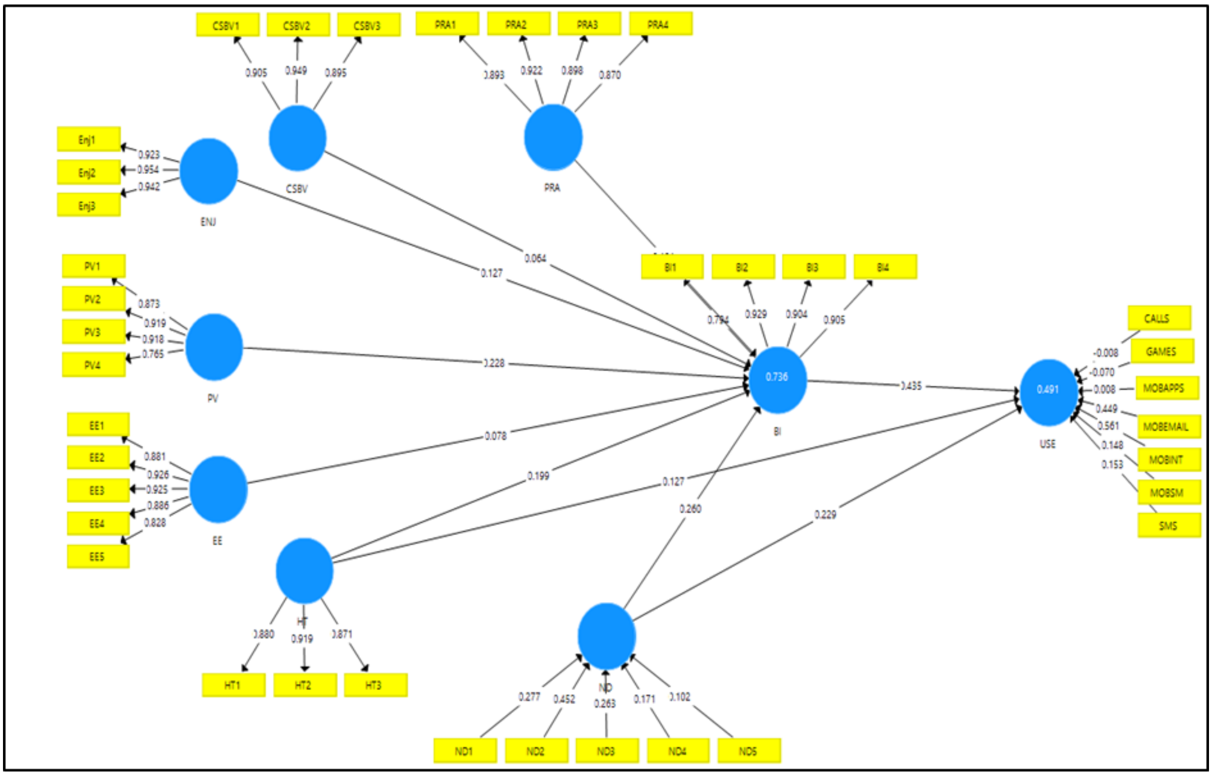
PLS-SEM Model for the Income Moderator Subsample (Users with high income) for the Jordanian Sample



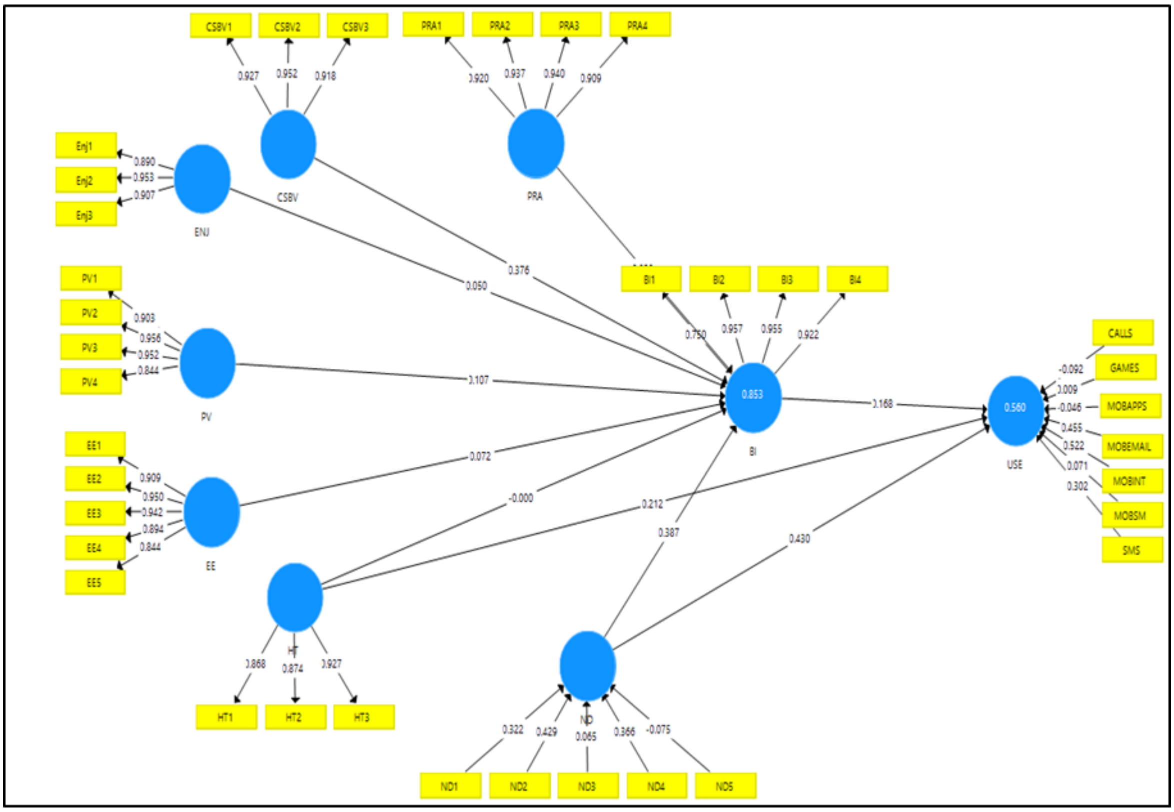
Results of Parametric Test for the Income Moderator Variable for the Jordanian Sample

Hypothesis	Relationship	Path Coefficients-diff (Low Income users - High Income Users)	t-Value (Low Income users vs High Income Users)	p-Value (Low Income users vs High Income Users)
H10a	**PV -> BI**	0.085	1.061	0.289
H9a	**ENJ -> BI**	0.375	3.151	0.002
	CSBV -> BI	0.472	3.678	0.000

PLS-SEM Model for the Experience Moderator Subsample (Users with low experience) for the Jordanian Sample



PLS-SEM Model for the Experience Moderator Subsample (Users with high experience) for the Jordanian Sample



Results of Parametric Test for the Experience Moderator's Effect for the Jordanian Sample

Hypothesis	**Relationship**	**Path Coefficients-diff (Low experience) – (High experience)**	**t-Value (Low experience vs High experience)**	**p-Value (Low experience vs High experience)**
H3a	**BI -> USE**	0.267	1.295	0.196
H14a	**CSBV -> BI**	0.312	2.755	0.006
H5a	**EE -> BI**	0.006	0.066	0.947
H11a	**HT -> BI**	0.199	2.586	0.010
H12a	**HT -> USE**	0.085	0.632	0.528
H9a	**Enj->BI**	0.076	1.127	0.260
	PRA -> BI	0.143	1.827	0.068

Results of Assessment of Mean Differences Between Younger and Older Users in Terms of Usage of Mobile Phones and their Applications Among Jordanian Users

AGE		CALLS	SMS	MOBINT	GAMES	MOBEMAIL	MOBAPPS	MOBSM	MOBBANK	MCOMMERCE
	Mean	6.43	5.407	6.03	5.419	5.287	6.12	6.084	1.784	1.719
	N	167	167	167	167	167	167	167	167	167
18-22	Std. Deviation	0.94	1.726	1.4329	1.8147	1.7939	1.43	1.445	1.223	1.217
	Mean	6.49	5.344	5.981	5.137	5.637	6.214	5.908	2.198	1.882
	N	262	262	262	262	262	262	262	262	262
23-29	Std. Deviation	0.879	1.66	1.4208	1.8867	1.586	1.191	1.63	1.531	1.318
	Mean	6.47	5.368	6	5.247	5.501	6.177	5.977	2.037	1.818
	N	429	429	429	429	429	429	429	429	429
Total	Std. Deviation	0.903	1.684	1.4241	1.8619	1.6767	1.289	1.562	1.432	1.281

Results of Assessment of Mean Differences Between High Experience and Low Experience Users in Terms of Usage of Mobile Phones and their Applications Among Jordanian Users

EXP		CALLS	SMS	MOBINT	GAMES	MOB EMAIL	MOB APPS	MOBSM	MOBBANK	MCOMMERCE
Low Exp	Mean	6.45	5.239	6.060	5.248	5.550	6.174	5.968	1.775	1.6514
	N	218	218	218	218	218	218	218	218	218
	Std. Deviation	.931	1.6788	1.3479	1.8967	1.6820	1.3257	1.6360	1.1758	1.05495
High Exp	Mean	6.48	5.502	5.938	5.246	5.450	6.180	5.986	2.308	1.9905
	N	211	211	211	211	211	211	211	211	211
	Std. Deviation	.875	1.6829	1.4995	1.8299	1.6736	1.2520	1.4848	1.6139	1.46056
Total	Mean	6.47	5.368	6.000	5.247	5.501	6.177	5.977	2.037	1.8182
	N	429	429	429	429	429	429	429	429	429
	Std. Deviation	.903	1.6840	1.4241	1.8619	1.6767	1.2885	1.5616	1.4318	1.28053

Results of Explanatory Power for the Model in Jordan in Different Groups

	R^2 for BI	**R^2 for USE**
Original Model	0.777	0.510
Younger Users	0.770	0.523
Older Users	0.798	0.532
Males	0.776	0.466
Females	0.811	0.582
Low Education Level Users	**0.834**	**0.590**
High Education Level Users	0.775	0.507
Low Income Users	0.779	0.546
High Income Users	0.826	0.475
Low Experience Users	0.736	0.491
High Experience Users	**0.853**	**0.560**

Results of the Assessment of the Structural Model for the Jordanian Sample

	Path Coefficient	Standard Error	T Statistics	Signifi-cance levels	P Values	f^2	q^2
BI -> USE (H3)	0.284	0.101	2.822	**	0.005	0.051	
PRA -> BI (H4)	0.099	0.043	2.310	*	0.021	0.024	0.010
EE -> BI (H5)	0.125	0.055	2.269	*	0.024	0.025	0.010
SI -> BI (H6)	-0.012	0.027	0.435	NS	0.664	0.000	0.000
FC -> BI (H7)	-0.019	0.039	0.483	NS	0.630	0.001	0.000
FC -> USE (H8)	0.072	0.063	1.159	NS	0.247	0.007	
ENJ -> BI (H9)	0.099	0.032	3.110	**	0.002	0.024	0.010
PV -> BI (H10)	0.197	0.057	3.487	***	0.001	0.072	0.036
HT -> BI (H11)	0.137	0.038	3.578	***	0.000	0.040	0.020
HT -> USE (H12)	0.175	0.067	2.608	**	0.009	0.033	
TC -> BI (H13)	-0.022	0.033	0.657	NS	0.511	0.001	0.000
CSBV -> BI (H14)	0.160	0.060	2.676	**	0.008	0.040	0.018
ND -> BI (H15)	0.306	0.067	4.560	***	0.000	0.121	0.057
ND -> USE (H16)	0.285	0.104	2.748	**	0.006	0.060	

* Significance level P ≤ 0.05. ** Significance level P ≤ 0.01. *** Significance level P ≤ 0.001.
NS = not significant

Results of Hypothesis Testing for the Model in Jordan

Hypotheses	Results
H1: Young Arabs accept and use mobile phones	Supported
H2: The proposed model explains young Arab customers’ acceptance of mobile phones.	Supported
H3. Behavioural Intention to use mobile phones has a positive significant direct effect on Actual Usage.	Supported

H3a. Experience moderates the effect of Behavioural Intention on Actual Usage such that this effect is stronger among users with a low level of experience.	Rejected
H4: PRA (usefulness) has a positive significant effect on Behavioural Intention.	Supported
H4a. Age and gender moderate the effect of Perceived Relative Advantage (usefulness) on Behavioural Intention such that this effect is stronger among younger individuals and men.	Partially supported
H5. Effort Expectancy has a positive significant effect on Behavioural Intention.	Supported
H5a. Age, gender, experience and education moderate the effect of Effort Expectancy on Behavioural Intention such that this effect is stronger among older individuals, women, individuals with a low experience level and individuals with a low education level.	Partially supported
H6. Social Influence has a positive significant effect on Behavioural Intention.	Rejected
H6a. Age, gender and experience moderate the effect of Social Influence on Behavioural Intention such that this effect is stronger among older individuals, women and individuals with a low level of experience.	Rejected
H7. Facilitating Conditions have a positive significant effect on Behavioural Intention.	Rejected
H7a. Age, gender and experience moderate the effect of Facilitating Conditions on Behavioural Intention such that this effect is stronger among older individuals, women and individuals with a low level of experience.	Rejected
H8. Facilitating Conditions have a positive significant direct effect on Actual Usage.	Rejected
H8a. Age, gender and experience moderate the effect of Facilitating Conditions on Actual Usage such that this effect is stronger among older individuals, women and individuals with a low level of experience.	Rejected
H9. Enjoyment has a positive significant effect on Behavioural Intention.	Supported
H9a. Age, gender, experience and income moderate the effect of Enjoyment on Behavioural Intention such that this effect is stronger	Rejected

among younger individuals, men, individuals with a low level of experience and individuals with a high income level.	
H10. Price Value has a positive significant effect on Behavioural Intention.	Supported
H10a. Age, gender and income moderate the effect of Price Value on Behavioural Intention such that this effect is stronger among older individuals, women and individuals with low income level.	Partially supported
H11. Habit has a positive significant effect on Behavioural Intention	Supported
H11a. Age, gender and experience moderate the effect of Habit on Behavioural Intention such that this effect is stronger among older indviduals, men and individuals with a high level of experience.	Partially supported
H12. Habit has a positive significant direct effect on Actual Usage	Supported
H12a. Age, gender and experience moderate the effect of Habit on Actual Usage such that this effect is stronger among older individuals, men and individuals with a high level of experience.	Rejected
H13. Technological Culturation has a positive significant effect on Behavioural Intention.	Rejected
H13a. Age, gender and income moderate the effect of Technological Culturation on Behavioural Intention such that this effect is stronger among younger individuals, men and individuals with a high income level.	Rejected
H14. Culture-Specific Beliefs and Values have a positive significant effect on Behavioural Intention.	Supported
H14a. Age, gender and experience moderate the effect of Culture-Specific Beliefs and Values on Behavioural Intention such that preference for mobile mediated meetings is stronger among younger individuals, women and individuals with a high level of experience.	Partially supported
H15. National IT Development has a positive significant effect on Behavioural Intention.	Supported
H15a. Age and gender moderate the effect of National IT Development on Behavioural Intention such that this effect is stronger among younger individuals and men.	Partially supported
H16: National IT Development has a positive significant direct effect on Actual Use.	Supported

H16a. Age and gender moderate the effect of National IT Development on Actual Usage such that this effect is stronger among younger indivduals and men.	Rejected

Appendix-S: Results of the Analysis of the Data from UAE

Results of Assessment of Mann-Whitney-U-Test for Testing Non-response Bias for the UAE Sample

	TC	USE	FC	Enj	SI	PRA
Mann-Whitney U	1217.500	1203.000	1220.500	1052.500	1236.000	1158.500
Wilcoxon W	2492.500	2478.000	2495.500	2327.500	2511.000	2433.500
Z	-.226	-.324	-.204	-1.385	-.097	-.645
Asymp. Sig. (2-tailed)	.821	.746	.838	.166	.923	.519

	EE	CSBV	ND	PV	BI	HT
Mann-Whitney U	1071.000	1050.500	1191.000	1025.500	1088.000	1137.000
Wilcoxon W	2346.000	2325.500	2466.000	2300.500	2363.000	2412.000
Z	-1.244	-1.387	-.409	-1.554	-1.196	-.794
Asymp. Sig. (2-tailed)	.213	.165	.682	.120	.232	.427

Grouping Variable: Respondent (1=early, 2=late)

Descriptive Statistics for the UAE Sample

The Country the respondents were born in

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	UAE	268	61.3	61.3	61.3

	Egypt	56	12.8	12.8	74.1
	Iraq	10	2.3	2.3	76.4
	Jordan	2	.5	.5	76.9
	Kuwait	30	6.9	6.9	83.8
	Lebanon	4	.9	.9	84.7
	Morocco	2	.5	.5	85.1
	Qatar	45	10.3	10.3	95.4
	Saudi Arabia	20	4.6	4.6	100.0
	Total	437	100.0	100.0	

The Number of Years the Respondents spent in UAE

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	3.00	41	9.4	9.4	9.4
	4.00	34	7.8	7.8	17.2
	5.00	25	5.7	5.7	22.9
	6.00	18	4.1	4.1	27.0
	7.00	15	3.4	3.4	30.4
	8.00	9	2.1	2.1	32.5
	9.00	5	1.1	1.1	33.6
	10.00	13	3.0	3.0	36.6
	11.00	2	.5	.5	37.1
	12.00	4	.9	.9	38.0
	14.00	4	.9	.9	38.9
	15.00	3	.7	.7	39.6

	18.00	61	14.0	14.0	53.5
	19.00	67	15.3	15.3	68.9
	20.00	24	5.5	5.5	74.4
	21.00	48	11.0	11.0	85.4
	22.00	21	4.8	4.8	90.2
	23.00	4	.9	.9	91.1
	24.00	1	.2	.2	91.3
	25.00	8	1.8	1.8	93.1
	26.00	8	1.8	1.8	95.0
	27.00	6	1.4	1.4	96.3
	28.00	9	2.1	2.1	98.4
	29.00	7	1.6	1.6	100.0
	Total	437	100.0	100.0	

Age of Respondents in UAE

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18-22	226	51.7	51.7	51.7
	23-29	211	48.3	48.3	100.0
	Total	437	100.0	100.0	

Gender of Respondents in UAE

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	231	52.9	52.9	52.9

	Female	206	47.1	47.1	100.0
	Total	437	100.0	100.0	

Education Level of Respondents in UAE

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	High School	50	11.4	11.4	11.4
	Diploma	77	17.6	17.6	29.1
	Bachelor Degree	242	55.4	55.4	84.4
	Master Degree	33	7.6	7.6	92.0
	PhD Degree	35	8.0	8.0	100.0
	Total	437	100.0	100.0	

Results of Employment Status of Respondents in UAE

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Employed	233	53.3	53.3	53.3
	Self-employed	23	5.3	5.3	58.6
	Unemployed and currently looking for work	23	5.3	5.3	63.8
	Unemployed and not looking for work	6	1.4	1.4	65.2
	Student	151	34.6	34.6	99.8
	Other	1	.2	.2	100.0
	Total	437	100.0	100.0	

Results of Income Level of Respondents in UAE

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than $10,000	136	31.1	31.1	31.1
	$10,000 to $19,000	64	14.6	14.6	45.8
	$20,000 to $29,000	91	20.8	20.8	66.6
	$30,000 to $39,000	94	21.5	21.5	88.1
	$40,000 to $49,000	21	4.8	4.8	92.9
	$50,000 or more	31	7.1	7.1	100.0
	Total	437	100.0	100.0	

Results of Assessment of Arabic Language Reading Fluency in the UAE Sample

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	437	100.0	100.0	100.0

Results of Assessment of Arabic Language Writing Fluency in the UAE Sample

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	437	100.0	100.0	100.0

Results of Assessment of Arabic Language Speaking Fluency in the UAE Sample

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	437	100.0	100.0	100.0

Results of Assessment of English Language Reading Fluency in the UAE Sample

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	391	89.5	89.5	89.5
	No	46	10.5	10.5	100.0
	Total	437	100.0	100.0	

Results of Assessment of English Language Writing Fluency in the UAE Sample

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	373	85.4	85.4	85.4
	No	64	14.6	14.6	100.0
	Total	437	100.0	100.0	

Results of Assessment of English Language Speaking Fluency in the UAE Sample

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	409	93.6	93.6	93.6
	No	28	6.4	6.4	100.0
	Total	437	100.0	100.0	

Results of Asessment of Mobile Phone Use for the UAE Sample

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	437	100.0	100.0	100.0

Results of Asessment of Experience in Using Mobile Phone for the UAE Sample

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than 3 years	16	3.7	3.7	3.7
	Less than 5 years	17	3.9	3.9	7.6

	Less than 7 years	50	11.4	11.4	19.0
	Less than 10 years	57	13.0	13.0	32.0
	More than 10 years	297	68.0	68.0	100.0
	Total	437	100.0	100.0	

Summary for Types of Mobile Phones Used by Respondents in UAE

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		8	1.8	1.8	1.8
	BLACKBER	20	4.6	4.6	6.4
	HTC	28	6.4	6.4	12.8
	HUAWEI	16	3.7	3.7	16.5
	iPHONE	180	41.2	41.2	57.7
	LENOVO	10	2.3	2.3	60.0
	LG	15	3.4	3.4	63.4
	MOTOROLA	1	.2	.2	63.6
	NOKIA	45	10.3	10.3	73.9
	SAMSUNG	102	23.3	23.3	97.3
	SONY	12	2.7	2.7	100.0
	Total	437	100.0	100.0	

Summary for Use of Mobile Applications by Respondents in UAE

Descriptive Statistics

	Minimum	Maximum	Mean	Std. Deviation	Variance
CALLS	1	7	5.38	0.976	0.953
SMS	1	7	5.69	1.589	2.526
MOBINT	1	7	6.06	1.388	1.928
GAMES	1	7	5.37	1.800	3.238
MOBEMAIL	1	7	5.58	1.597	2.551
MOBAPPS	3	7	5.26	0.891	0.793
MOBSM	1	7	6.02	1.476	2.178
MOBBANK	1	7	2.56	1.543	2.380
MCOMMERCE	1	7	2.27	1.422	2.023

Results of Descriptive Statistics for Likert Scale Items for the UAE Sample

	Minimum	Maximum	Mean	Std. Deviation	Variance
FC1	1	7	4.94	1.91	3.65
FC2	1	7	5.04	1.83	3.34
FC3	1	7	5.38	1.63	2.67
FC4	1	7	5.25	1.47	2.15
FC5	1	7	5.00	1.61	2.60
FC6	1	7	5.81	1.40	1.95
Enj1	1	7	5.97	1.64	2.70
Enj2	1	7	5.57	1.53	2.33
Enj3	1	7	5.54	1.61	2.59

SI1	1	7	4.55	2.02	4.07
SI2	1	7	4.07	2.13	4.52
SI3	1	7	5.03	1.63	2.67
PRA1	1	7	5.91	1.50	2.25
PRA2	1	7	5.89	1.42	2.01
PRA3	1	7	5.83	1.49	2.21
PRA4	1	7	5.28	1.76	3.09
EE1	1	7	5.90	1.45	2.11
EE2	1	7	5.84	1.36	1.84
EE3	1	7	5.82	1.37	1.87
EE4	1	7	5.78	1.47	2.15
EE5	1	7	5.81	1.38	1.90
CSBV1	1	7	5.39	1.71	2.93
CSBV2	1	7	5.33	1.60	2.57
CSBV3	1	7	5.22	1.65	2.73
TC1	1	7	4.20	2.31	5.38
TC2	1	7	3.53	2.22	4.96
TC3	1	7	4.99	1.47	2.18
ND1	1	7	5.78	1.47	2.17
ND2	1	7	5.82	1.39	1.94
ND3	1	7	5.46	1.55	2.41
ND4	1	7	4.93	1.70	2.89
ND5	1	7	4.75	1.68	2.81
PV1	1	7	5.52	1.66	2.77
PV2	1	7	5.47	1.62	2.61
PV3	1	7	5.57	1.52	2.30
PV4	1	7	5.35	1.52	2.32
PV5	1	7	4.74	1.74	3.04

PV6	1	7	4.96	1.56	2.44
BI1	1	7	5.88	1.50	2.26
BI2	1	7	5.83	1.48	2.18
BI3	1	7	5.81	1.48	2.20
BI4	1	7	5.84	1.50	2.26
HT1	1	7	5.55	1.65	2.73
HT2	1	7	5.61	1.60	2.57
HT3	1	7	5.26	1.76	3.09

Summary of Descriptive Statistics on UAE Respondents' Agreement Whether Challenges Facing Mobile Phone Adoption and Use Exist

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	206	47.1	47.1	47.1
	No	231	52.9	52.9	100.0
	Total	437	100.0	100.0	

Summary of Challenges Facing Mobile Phone Adoption and Use in UAE

	YES	**NO**
POORICT	7.6%	92.4%
LACKOFREG	12.1%	87.9%
HIGHPRICETAR	21.5%	78.5%
HIGHPRICEMOB	24.5%	75.5%
HIGHPRICEINT	22.4%	77.6%
BADNET	17.4%	82.6%
MONOPOLY	22.0%	78.0%
RESTMOBAPPS	26.5%	73.5%
ETHICISSUES	20.4%	79.6%
CULTUISSUES	17.6%	82.4%

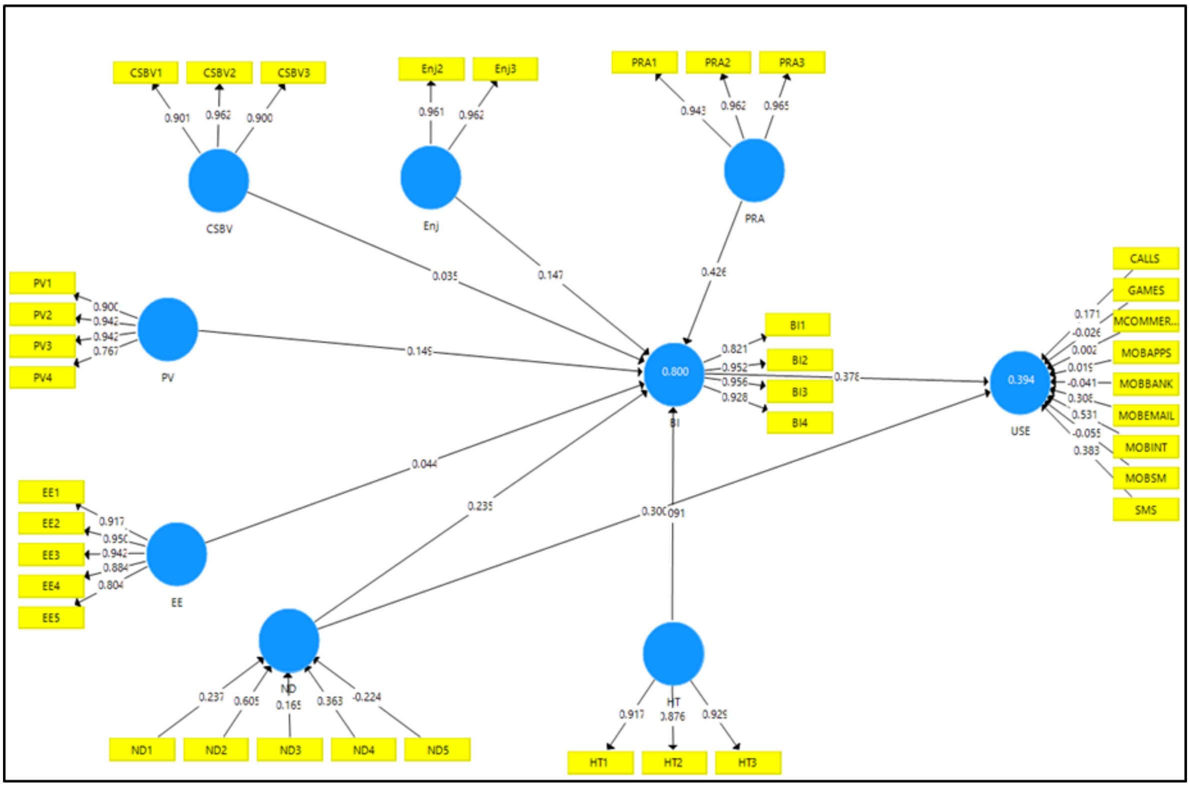
OTHER	0.0%	100.0%

Results of Assessment of Normality of Data Distribution for the UAE Sample

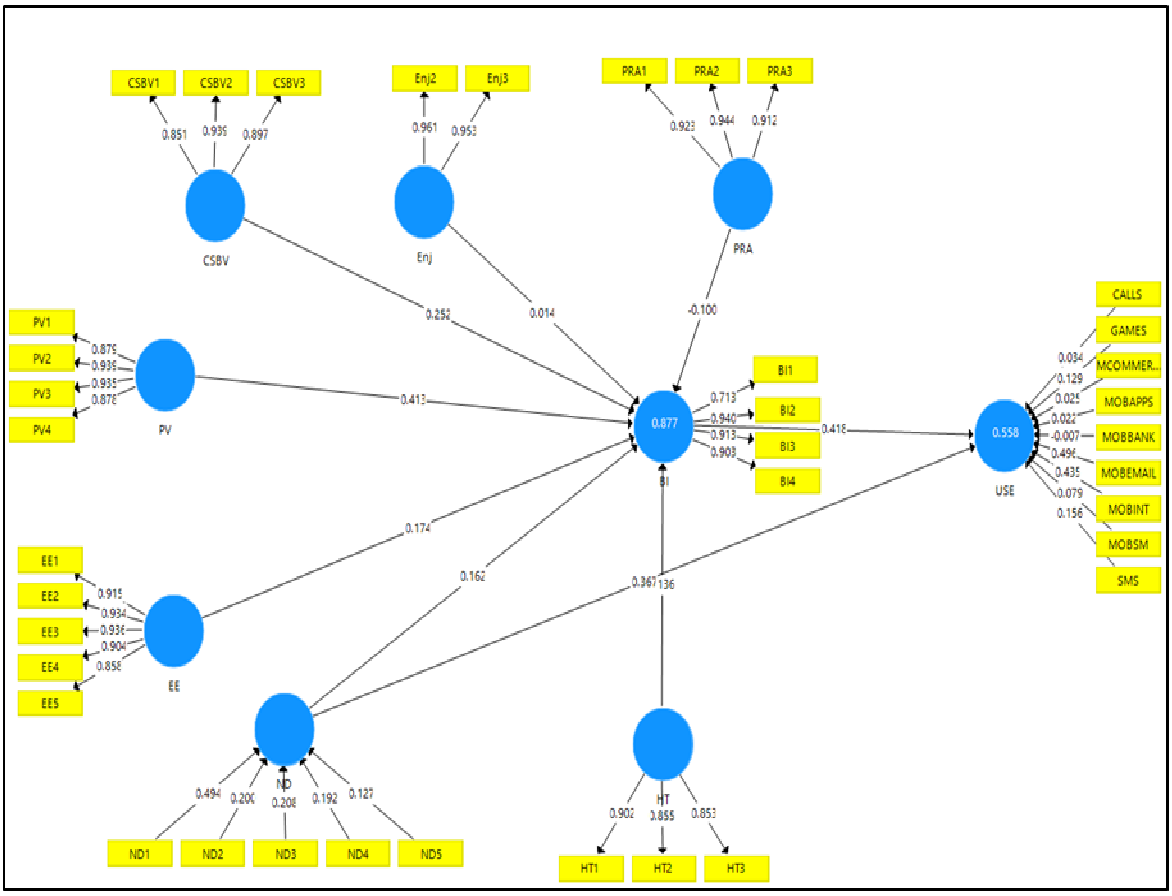
	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
FC1	1	7	5.09	1.90926	-0.605	0.117	-0.889	0.233
FC2	1	7	4.95	1.82695	-0.68	0.117	-0.797	0.233
FC3	1	7	5.48	1.63319	-0.769	0.117	-0.493	0.233
FC4	1	7	5.33	1.46661	-0.758	0.117	0.335	0.233
FC5	1	7	5.21	1.61273	-0.528	0.117	-0.604	0.233
FC6	1	7	5.21	1.39625	**-1.256**	0.117	**1.067**	0.233
Enj1	1	7	4.82	1.64276	**-1.624**	0.117	**1.587**	0.233
Enj2	1	7	5.06	1.52586	**-1.215**	0.117	**1.121**	0.233
Enj3	1	7	4.92	1.60896	**-1.193**	0.117	0.900	0.233
SI1	1	7	5.25	2.01832	-0.06	0.117	**-1.418**	0.233
SI2	1	7	5.00	2.12669	0.107	0.117	**-1.637**	0.233
SI3	1	7	5.04	1.63444	-0.987	0.117	0.527	0.233
PRA1	1	7	5.74	1.49824	**-1.762**	0.117	**2.764**	0.233
PRA2	1	7	5.88	1.41677	**-1.699**	0.117	**2.817**	0.233
PRA3	1	7	5.75	1.48654	**-1.487**	0.117	**1.738**	0.233
PRA4	1	7	5.65	1.75756	-0.907	0.117	-0.281	0.233
EE1	1	7	5.59	1.4507	**-1.703**	0.117	**2.583**	0.233
EE2	1	7	5.54	1.3575	**-1.637**	0.117	**2.707**	0.233
EE3	1	7	5.49	1.36751	**-1.569**	0.117	**2.526**	0.233
EE4	1	7	5.52	1.46502	**-1.606**	0.117	**2.369**	0.233
EE5	1	7	5.54	1.37961	**-1.657**	0.117	**2.780**	0.233

CSBV1	1	7	5.25	1.71183	**-1.053**	0.117	0.184	0.233
CSBV2	1	7	5.06	1.60314	-0.907	0.117	0.043	0.233
CSBV3	1	7	4.65	1.65271	-0.85	0.117	0.002	0.233
TC1	1	7	5.61	2.31967	-0.184	0.117	**-1.589**	0.233
TC2	1	7	5.37	2.22817	0.386	0.117	**-1.477**	0.233
TC3	1	7	5.19	1.47842	-0.416	0.117	-0.170	0.233
ND1	1	7	5.46	1.47414	**-1.507**	0.117	**2.010**	0.233
ND2	1	7	5.42	1.39409	**-1.384**	0.117	**1.680**	0.233
ND3	1	7	4.95	1.55066	**-1.036**	0.117	0.513	0.233
ND4	1	7	4.98	1.70109	-0.731	0.117	-0.259	0.233
ND5	1	7	4.92	1.67675	-0.578	0.117	-0.399	0.233
PV1	1	7	5.06	1.66392	**-1.127**	0.117	0.429	0.233
PV2	1	7	5.39	1.61625	**-1.012**	0.117	0.227	0.233
PV3	1	7	5.42	1.51702	**-1.079**	0.117	0.585	0.233
PV4	1	7	5.27	1.52158	-0.869	0.117	0.291	0.233
PV5	1	7	5.26	1.74247	-0.545	0.117	-0.676	0.233
PV6	1	7	4.76	1.56309	-0.666	0.117	-0.133	0.233
BI1	1	7	5.86	1.50367	**-1.618**	0.117	**2.181**	0.233
BI2	1	7	5.73	1.47674	**-1.487**	0.117	**1.763**	0.233
BI3	1	7	5.62	1.48230	**-1.470**	0.117	**1.755**	0.233
BI4	1	7	5.59	1.50185	**-1.557**	0.117	**2.032**	0.233
HT1	1	7	5.60	1.65207	**-1.158**	0.117	0.540	0.233
HT2	1	7	4.91	1.60265	**-1.267**	0.117	**1.018**	0.233
HT3	1	7	5.37	1.75882	-0.932	0.117	-0.111	0.233

PLS-SEM Model for the Age Moderator Subsample (Younger users) for the UAE Sample



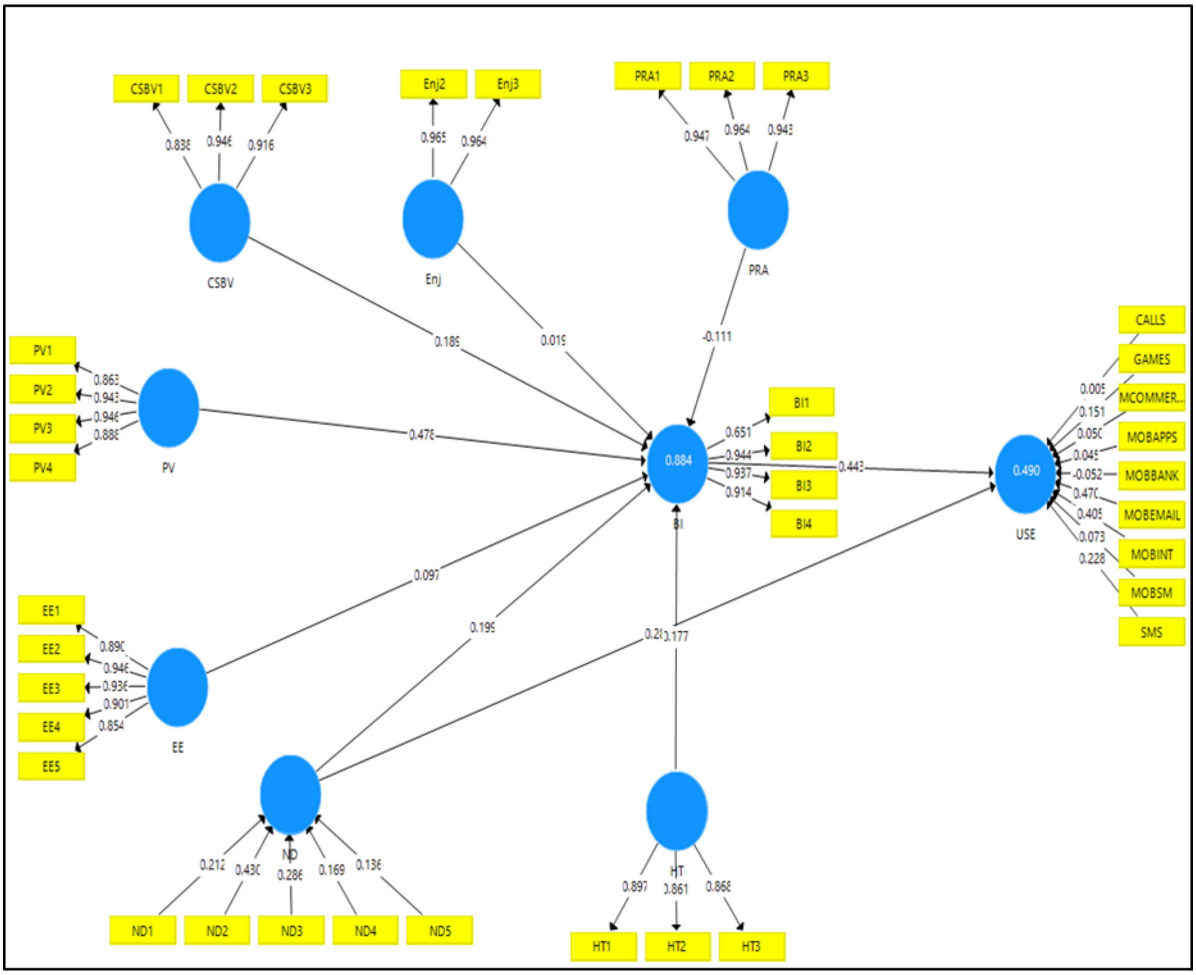
PLS-SEM Model for the Age Moderator Subsample (Older users) for the UAE Sample



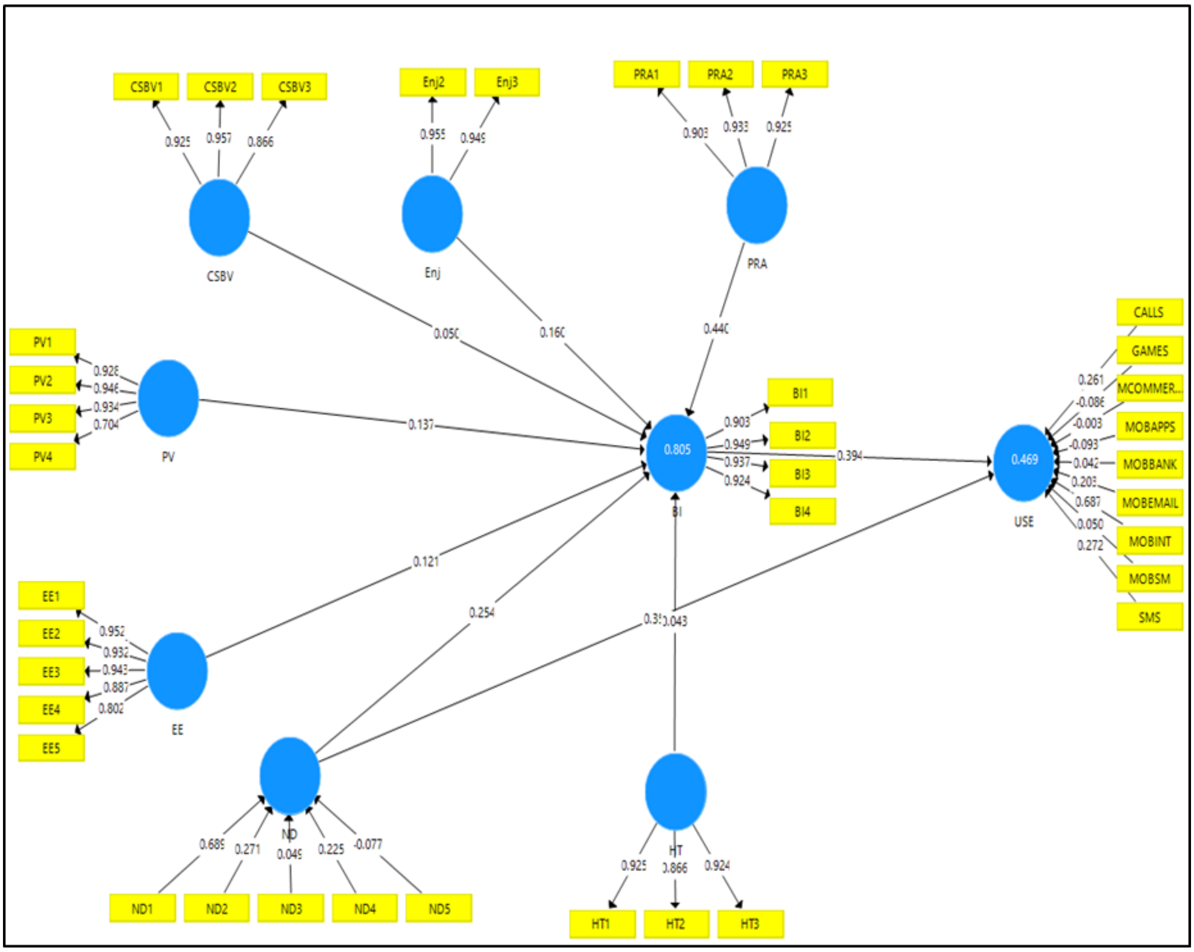
Results of Parametric Test for the Age Moderator's Effect for the UAE Sample

Hypothesis	Relationship	Path Coefficients-diff (Younger group) - (Older Group)	t-Value (Younger group) vs (Older Group)	p-Value (Younger users) vs Older users)
H14a	**CSBV -> BI**	0.217	2.616	0.009
H5a	**EE -> BI**	0.131	2.048	0.041
H9a	**Enj -> BI**	0.133	2.688	0.007
H11a	**HT -> BI**	0.045	0.691	0.490
H15a	**ND -> BI**	0.074	0.787	0.432
H16a	**ND -> USE**	0.067	0.372	0.710
H4a	**PRA -> BI**	0.526	4.995	0.000
H10a	**PV -> BI**	0.264	2.707	0.007

PLS-SEM Model for the Gender Moderator Subsample (Male users) for the UAE Sample



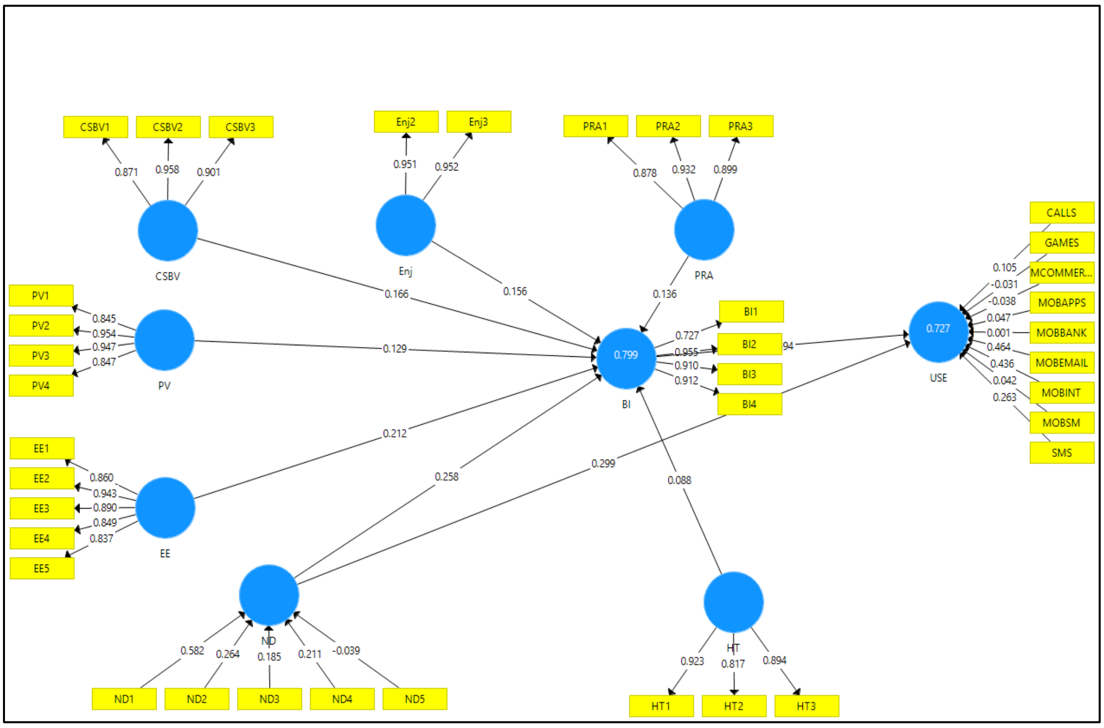
PLS-SEM Model for the Gender Moderator Subsample (Female users) for the UAE Sample



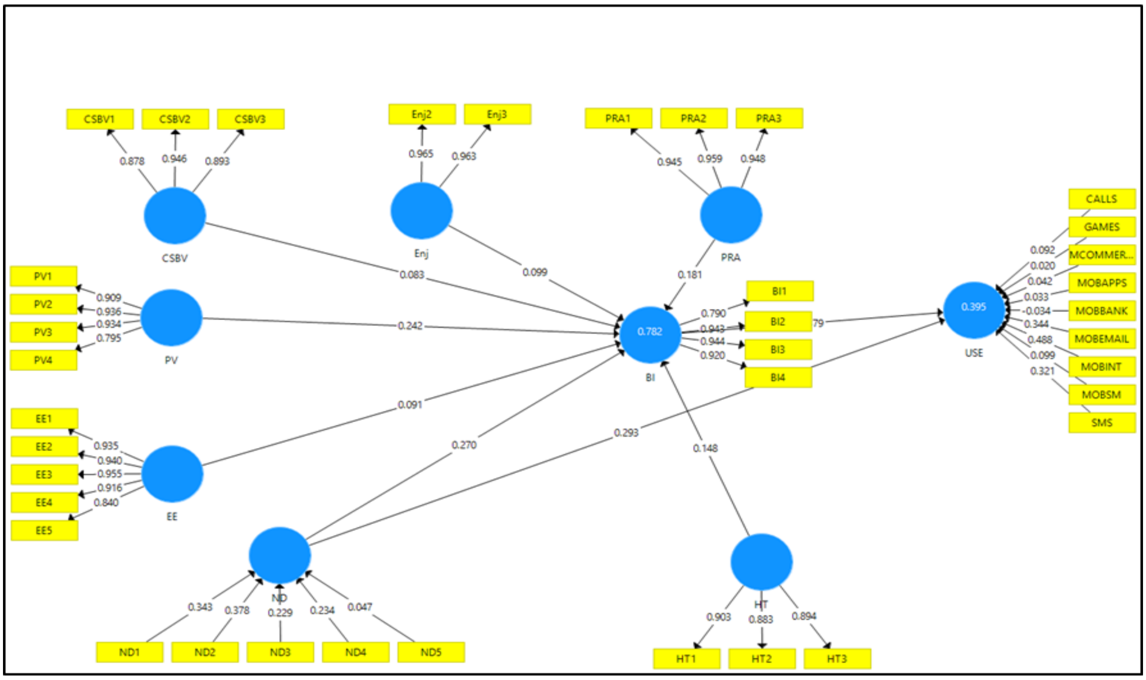
Results of Parametric test for the Gender Moderator's Effect for the UAE Sample

Hypothesis	Relationship	Path Coefficients-diff (Males – Females)	t-Value (Males vs Females)	p-Value (Males vs Females)
H14a	**CSBV -> BI**	0.139	1.696	0.091
H5a	**EE -> BI**	0.024	0.332	0.740
H9a	**Enj -> BI**	0.141	3.038	0.003
H11a	**HT -> BI**	0.133	2.188	0.029
H15a	**ND -> BI**	0.055	0.683	0.495
H16a	**ND -> USE**	0.063	0.304	0.761
H4a	**PRA -> BI**	0.551	6.224	0.000
H10a	**PV -> BI**	0.341	3.115	0.002

PLS-SEM Model for the Education Moderator Subsample (Low education users) for UAE Sample



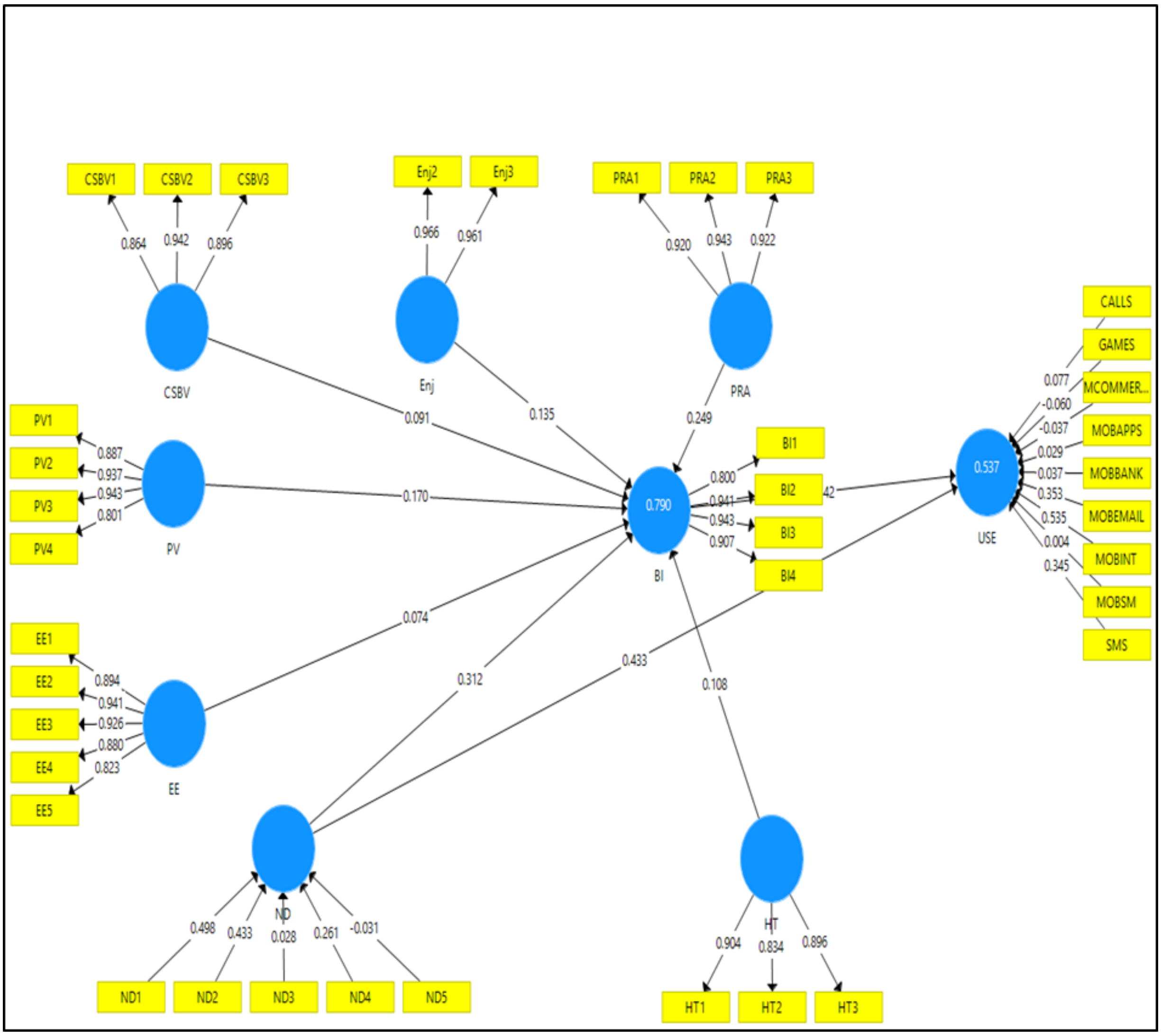
PLS-SEM Model for the Education Moderator Subsample (High education users) for the UAE Sample



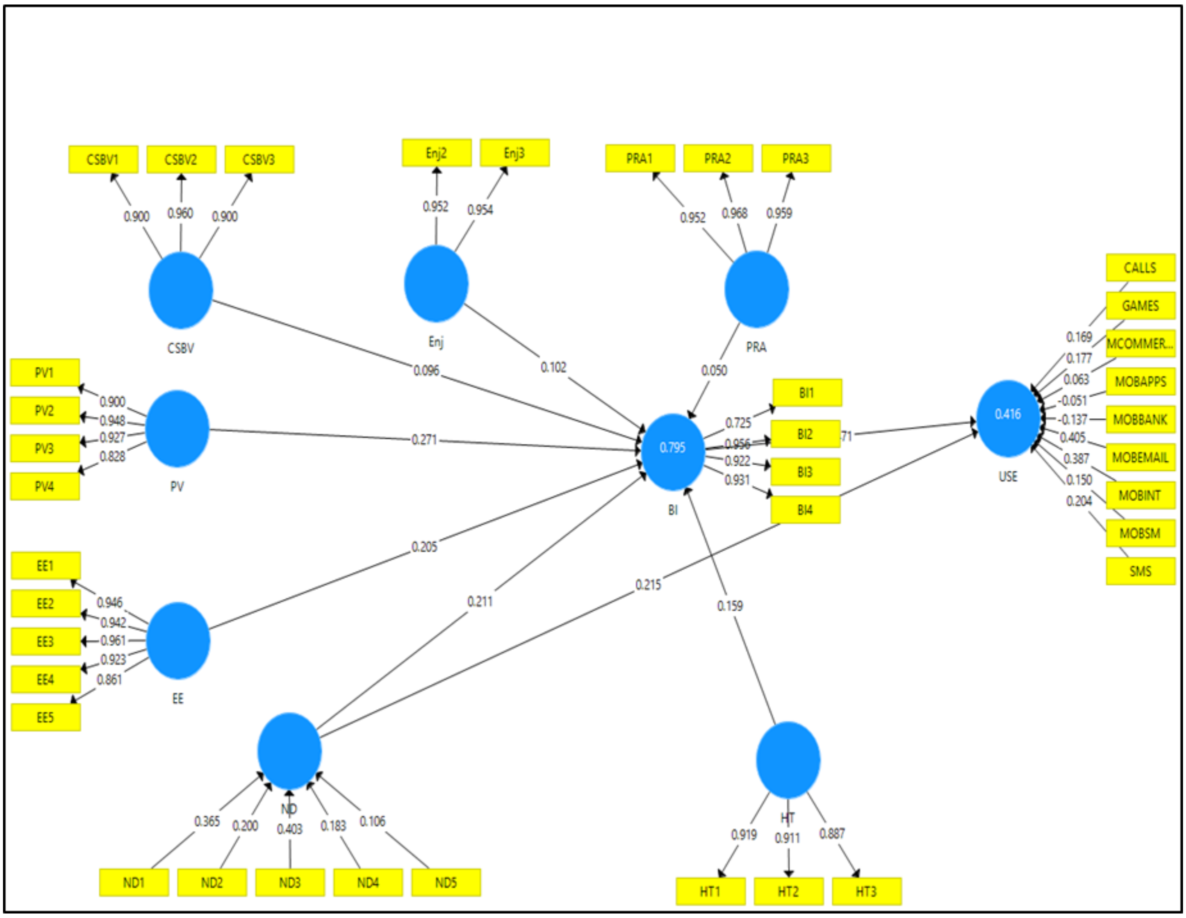
Results of Parametric Test for the Education Moderator's Effect for the UAE Sample

		Path Coefficients-diff (low education – high education)	t-Value (low education vs high education)	p-Value (high education vs high education)
H5a	**EE -> BI**	0.121	1.189	0.235

PLS-SEM Model for the Income Moderator Subsample (Users with low income) for the UAE Sample



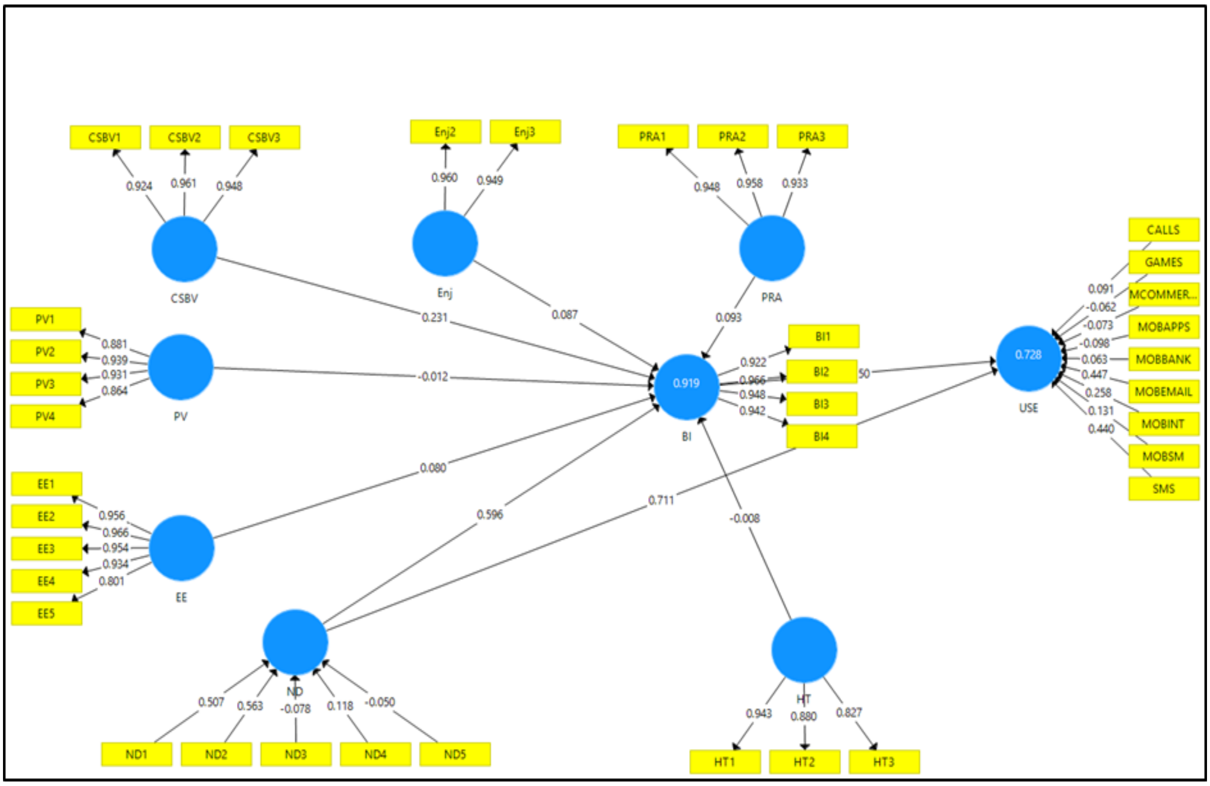
PLS-SEM Model for the Income Moderator Subsample (Users with high income) for the UAE Sample



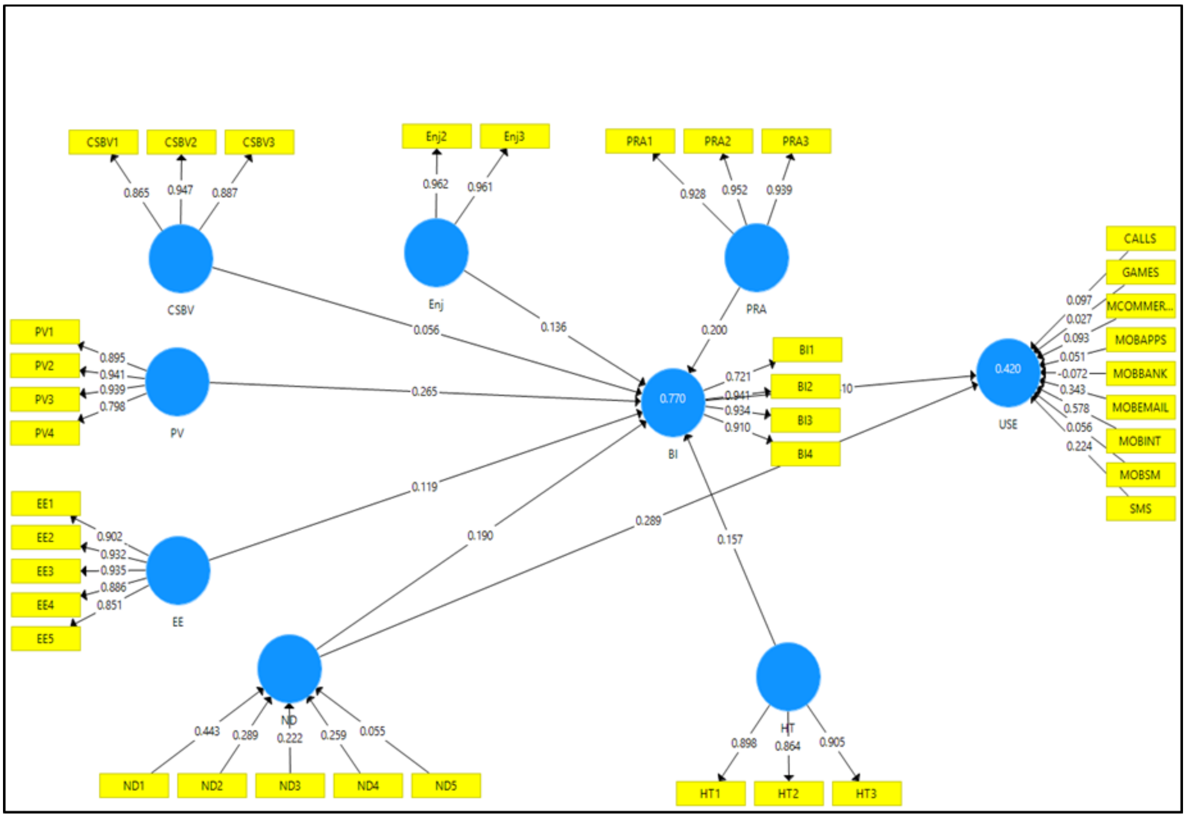
Results of Parametric Test for Income Moderator Variable for the UAE Sample

Hypothesis	Relationship	Path Coefficients-diff (Low Income users - High Income Users)	t-Value (Low Income users vs High Income Users)	p-Value (Low Income users vs High Income Users)
H10a	**PV -> BI**	0.101	0.998	0.319
H9a	**Enj -> BI**	0.033	0.501	0.617

PLS-SEM Model for the Experience Moderator Subsample (Users with low experience) for the UAE Sample



PLS-SEM Model for the Experience Moderator Subsample (Users with high experience) for the UAE Sample



Results of Parametric Test for the Experience Moderator's Effect for the UAE Sample

Hypothesis	**Relationship**	**Path Coefficients-diff (Low experience) – (High experience)**	**t-Value (Low experience vs High experience)**	**p-Value (Low experience vs High experience)**
H3a	**BI -> USE**	0.260	1.270	0.205
H14a	**CSBV -> BI**	0.175	1.964	0.055
H5a	**EE -> BI**	0.039	0.322	0.748
H11a	**HT -> BI**	0.164	1.851	0.065
H9a	**Enj->BI**	0.049	0.624	0.533
	ND -> BI	0.407	3.436	0.001
	ND -> USE	0.422	1.973	0.049

Results of Assessment of Mean Differences Between Younger and Older Users in Terms of Usage of Mobile Phones and their Applications Among Users in UAE

AGE		CALLS	SMS	MOB INT	GAMES	MOB EMAIL	MOB APPS	MOB SM	MOB BANK	MCOMMERCE
18-22	Mean	6.50	5.973	6.221	5.442	5.712	6.274	6.181	2.823	2.5265
	N	226	226	226	226	226	226	226	226	226
	Std. Deviation	1.021	1.4634	1.2630	1.8230	1.5178	1.2702	1.3090	1.4650	1.35702
23-29	Mean	6.36	5.389	5.886	5.294	5.441	6.128	5.853	2.270	1.9953
	N	211	211	211	211	211	211	211	211	211
	Std. Deviation	1.168	1.6650	1.4949	1.7752	1.6705	1.2258	1.6219	1.5760	1.44254
Total	Mean	6.43	5.691	6.059	5.371	5.581	6.204	6.023	2.556	2.2700
	N	437	437	437	437	437	437	437	437	437
	Std. Deviation	1.095	1.5893	1.3884	1.7996	1.5973	1.2497	1.4759	1.5429	1.42241

Results of Assessment of Mean Differences Between High Experience and Low Experience Users in Terms of Usage of Mobile Phones and their Applications Among Users in UAE

EXP		CALLS	SMS	MOBINT	GAMES	MOB EMAIL	MOB APPS	MOB SM	MOBBANK	M-COMMERCE
Low Exp	Mean	5.69	5.566	5.566	5.458	5.446	5.133	5.795	2.494	2.1807
	N	83	83	83	83	83	83	83	83	83
	Std. Deviation	1.081	1.5788	1.6468	1.7895	1.6324	.6396	1.5985	1.5172	1.50726
High Exp	Mean	5.31	5.720	6.175	5.350	5.613	5.288	6.076	2.571	2.2910
	N	354	354	354	354	354	354	354	354	354
	Std. Deviation	.937	1.5926	1.2963	1.8038	1.5896	.9380	1.4429	1.5506	1.40318
Total	Mean	5.38	5.691	6.059	5.371	5.581	5.259	6.023	2.556	2.2700
	N	437	437	437	437	437	437	437	437	437
	Std. Deviation	.976	1.5893	1.3884	1.7996	1.5973	.8905	1.4759	1.5429	1.42241

Results of Explanatory Power for the Model in UAE in Different Groups

	R^2 for BI	R^2 for USE
Original Model	0.783	0.476
Younger Users	0.800	0.394
Older Users	0.877	0.558
Males	**0.884**	0.490
Females	0.805	0.469
Low Education Level Users	0.799	**0.727**
High Education Level Users	0.782	0.395
Low Income Users	0.790	0.537
High Income Users	0.795	0.416
Low Experience Users	**0.919**	**0.728**
High Experience Users	0.770	0.420

Results of the Assessment of the Structural Model for the UAE Sample

	Path Coefficients	Standard Error	T Statistics	Significance levels	P Values	f^2	$q2$
BI -> USE (H3)	0.382	0.093	4.088	***	0.000	0.090	
PRA -> BI (H4)	0.164	0.049	3.344	***	0.001	0.065	0.031

EE -> BI (H5)	0.114	0.044	2.594	**	0.010	0.028	0.010
SI -> BI (H6)	0.007	0.015	0.459	NS	0.646	0.000	0.000
FC -> BI (H7)	0.029	0.022	1.334	NS	0.183	0.003	0.000
FC -> USE (H8)	0.051	0.043	1.181	NS	0.238	0.004	
ENJ -> BI (H9)	0.120	0.030	3.964	***	0.000	0.037	0.015
PV -> BI (H10)	0.217	0.049	4.377	***	0.000	0.094	0.044
HT -> BI (H11)	0.133	0.038	3.538	***	0.000	0.039	0.015
HT -> USE (H12)	0.046	0.044	1.043	NS	0.298	0.002	
TC -> BI (H13)	-0.043	0.029	1.507	NS	0.132	0.005	0.000
CSBV -> BI (H14)	0.110	0.035	3.122	**	0.002	0.030	0.013
ND -> BI (H15)	0.285	0.053	5.343	***	0.000	0.133	0.058
ND -> USE (H16)	0.292	0.079	3.693	***	0.000	0.067	

* Significance level $P \leq 0.05$. ** Significance level $P \leq 0.01$. *** Significance level $P \leq 0.001$.
NS = not significant

Results of Hypothesis Testing for the Model in UAE

Hypotheses	Results
H1: Young Arabs accept and use mobile phones	Supported
H2: The proposed model explains young Arab customers' acceptance of mobile phones.	Supported
H3. Behavioural Intention to use mobile phones has a positive significant direct effect on Actual Usage.	Supported
H3a. Experience moderates the effect of Behavioural Intention on Actual Usage such that this effect is stronger among users with a low level of experience.	Rejected
H4: PRA (usefulness) has a positive significant effect on Behavioural Intention.	Supported

H4a. Age and gender moderate the effect of Perceived Relative Advantage (usefulness) on Behavioural Intention such that this effect is stronger among younger individuals and men.	Partially supported
H5. Effort Expectancy has a positive significant effect on Behavioural Intention.	Supported
H5a. Age, gender, experience and education moderate the effect of Effort Expectancy on Behavioural Intention such that this effect is stronger among older individuals, women, individuals with a low experience level and individuals with a low education level.	Partially supported
H6. Social Influence has a positive significant effect on Behavioural Intention.	Rejected
H6a. Age, gender and experience moderate the effect of Social Influence on Behavioural Intention such that this effect is stronger among older individuals, women and individuals with a low level of experience.	Rejected
H7. Facilitating Conditions have a positive significant effect on Behavioural Intention.	Rejected
H7a. Age, gender and experience moderate the effect of Facilitating Conditions on Behavioural Intention such that this effect is stronger among older individuals, women and individuals with a low level of experience.	Rejected
H8. Facilitating Conditions have a positive significant direct effect on Actual Usage.	Rejected
H8a. Age, gender and experience moderate the effect of Facilitating Conditions on Actual Usage such that this effect is stronger among older individuals, women and individuals with a low level of experience.	Rejected
H9. Enjoyment has a positive significant effect on Behavioural Intention.	Supported
H9a. Age, gender, experience and income moderate the effect of Enjoyment on Behavioural Intention such that this effect is stronger among younger individuals, men, individuals with a low level of experience and individuals with a high income level.	Partially supported
H10. Price Value has a positive significant effect on Behavioural Intention.	Supported

H10a. Age, gender and income moderate the effect of Price Value on Behavioural Intention such that this effect is stronger among older individuals, women and individuals with low income level.	Partially supported
H11. Habit has a positive significant effect on Behavioural Intention	Supported
H11a. Age, gender and experience moderate the effect of Habit on Behavioural Intention such that this effect is stronger among older indviduals, men and individuals with a high level of experience.	Partially supported
H12. Habit has a positive significant direct effect on Actual Usage	Rejected
H12a. Age, gender and experience moderate the effect of Habit on Actual Usage such that this effect is stronger among older individuals, men and individuals with a high level of experience.	Rejected
H13. Technological Culturation has a positive significant effect on Behavioural Intention.	Rejected
H13a. Age, gender and income moderate the effect of Technological Culturation on Behavioural Intention such that this effect is stronger among younger individuals, men and individuals with a high income level.	Rejected
H14. Culture-Specific Beliefs and Values have a positive significant effect on Behavioural Intention.	Supported
H14a. Age, gender and experience moderate the effect of Culture-Specific Beliefs and Values on Behavioural Intention such that preference for mobile mediated meetings is stronger among younger individuals, women and individuals with a high level of experience.	Partially supported
H15. National IT Development has a positive significant effect on Behavioural Intention.	Supported
H15a. Age and gender moderate the effect of National IT Development on Behavioural Intention such that this effect is stronger among younger individuals and men.	Rejected
H16: National IT Development has a positive significant direct effect on Actual Use.	Supported
H16a. Age and gender moderate the effect of National IT Development on Actual Usage such that this effect is stronger among younger indivduals and men.	Rejected

Appendix-T: Results of Parametric Multi-Group Analysis Test for the Three Countries (Group Comparisons)

	Path Coefficients-diff (| UAE – JORDAN)	t-Value (UAE vs JORDAN)	p-Value (UAE vs JORDAN)	Path Coefficients-diff (| IRAQ – JORDAN)	t-Value (IRAQ vs JORDAN)	p-Value (IRAQ vs JORDAN)	Path Coefficients-diff (| IRAQ - UAE |)	t-Value (IRAQ vs UAE)	p-Value (IRAQ vs UAE)
BI -> USE	0.079	0.594	0.553	0.128	0.931	0.352	0.049	0.360	0.719
CSBV -> BI	0.045	0.709	0.478	0.059	0.804	0.422	0.014	0.237	0.813
EE -> BI	0.009	0.125	0.901	0.016	0.206	0.837	0.025	0.362	0.717
ENJ -> BI	0.026	0.587	0.557	0.137	3.045	0.002	0.164	3.712	0.000
FC -> BI	0.057	1.243	0.214	0.012	0.222	0.824	0.070	1.564	0.118
FC -> USE	0.018	0.210	0.834	0.090	1.110	0.267	0.108	1.349	0.178
HT -> BI	0.002	0.040	0.968	0.063	1.166	0.244	0.065	1.162	0.245
HT -> USE	0.173	1.992	0.047	0.047	0.472	0.637	0.219	2.362	0.018
ND -> BI	0.020	0.241	0.809	0.180	2.180	0.030	0.160	2.208	0.028
ND -> USE	0.001	0.011	0.991	0.195	1.399	0.162	0.194	1.669	0.095
PRA -> BI	0.035	0.531	0.596	0.022	0.332	0.740	0.012	0.178	0.858
PV -> BI	0.026	0.352	0.725	0.066	0.938	0.349	0.092	1.310	0.190
SI -> BI	0.026	0.790	0.430	0.039	0.853	0.394	0.012	0.296	0.767
TC -> BI	0.024	0.526	0.599	0.323	5.283	0.000	0.347	5.831	0.000

Appendix-U: List of Author's Publications

Ameen, N. and Willis, R., 2016. Mobile phones and women's entrepreneurship: a qualitative study on how mobile phones can support women's entrepreneurship in Iraq. The Institute for Small Business and Entrepreneurship (ISBE) Conference proceedings, Paris: France. 2016.

Ameen, N. and Willis, R., 2016. The use of mobile phones to support women's entrepreneurship in the Arab countries. *International Journal of Gender and Entrepreneurship*, 8(4), pp. 424 - 445.

Ameen, N. and Willis, R., 2016. An investigation of the challenges facing the mobile telecommunications industry in United Arab Emirates from the young consumers' perspective. ITS Europe Conference proceedings, Cambridge. 2016.

Ameen, N., Willis, R. and Noori, M., 2016. An investigation of the adoption of educational technology in Iraqi higher education: evidence from Salahddine University. UKAIS Conference proceedings, Oxford. 2016.

Ameen, N. and Willis, R., 2016. Current and future challenges facing the mobile telecommunications industry in the Arab world. *International Journal on Embedded Systems*, 4, pp.1-6.

Ameen, N., Willis, R. and Brychan, T., 2015. Mobile adoption in the Arab countries: a conceptual framework [online], UKAIS Conference proceedings, Oxford. 2015. AIS Library, Available at: http://aisel.aisnet.org/ukais2015/1/ [Accessed 14 May 2016].

Ameen, N. and Willis, R., 2015. The effect of cultural values on technology adoption in the Arab countries. International Conference of Information Systems proceedings, Dubai, UAE. 2015.

Ameen, N. and Willis, R., 2015. The use of mobile phones to support women's entrepreneurship in the Arab countries. The Institute for Small Business and Entrepreneurship (ISBE) Conference proceedings, Glasgow. 2015.